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ELECTRO-COAGULATION OF TONSILS: SOME CLINICAL, PATHOLOGICAL AND BACTERIOLOGICAL OBSERVATIONS.[1]

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FOLLOWING upon the appearance of an article, "Chronic Tonsillitis and Its Surgical Treatment", by one of us during the latter part of last year,(1) certain statements have appeared in the correspondence section of this journal concerning the attitude which was taken up by the writer on the question of tonsil destruction by diathermy coagulation. We feel that it has now become necessary to reply to the various statements and to refute at least some of them, by offering evidence of scientific value. We decided that the presentation of the subject from the clinical, the pathological and the bacteriological aspects, would serve a useful purpose in helping to clarify the opinions of those practitioners who are treating diseased tonsils by this means and who, by their statements, are confused as to its advantages or otherwise. This paper is produced by us jointly after consultation over the material which forms its subject, and is divided into two parts, R. Graham Brown being responsible for the clinical and J. V. Duhig for the pathological and bacteriological part. It must be stated, however, that the authors are in substantial agreement on the issues raised in both parts.

[1] Read at a meeting of the Queensland Branch of the British Medical Association on April 1, 1932.

CLINICAL ASPECT (R. GRAHAM BROWN).

Introductory Remarks.

In reference to the above-mentioned article, I was addressing the general practitioner mainly, and I pointed out that it was even more difficult to treat tonsils by surgical diathermy than by dissection. Throat specialists are obtaining more or less satisfactory results by the use of this method, and I have already stated that this is only to be expected when the treatment is carried out by experts in throat surgery, who, in addition, have a knowledge of the diathermy current and are endowed with the dexterity which is necessary for its satisfactory application. I again say that only such experts are in the position to determine what is the most suitable treatment for each particular case. This is in agreement with Dr. Dan McKenzie's statement that the practitioner must be skilled in the method. A large number of diathermy machines have been sold throughout Australia as a result of the persuasion of the manufacturers' agents, some of whom have not hesitated to use an article which appeared in our journal. In consequence it is to be regretted that many practitioners were persuaded to buy this apparatus, believing that the past difficulties they had experienced in the surgical treatment of diseased tonsils would be eliminated by an easy procedure of a few simple coagulations with a diathermy needle. The writer has met with a number of practitioners who soon discarded this method, because they quickly observed that the difficulties during the treatment were many, and that the results were not as satisfactory as they had anticipated. However, there are others who are persisting with the method, and most of them, I believe, conscientiously have the opinion that it offers the best treatment. It is to these particularly that this paper is directed.

Statements Made by Many Practitioners of Diathermy Coagulation.

The following are some of the statements which are still being repeated.

1. The tonsils can be completely removed without inconvenience or loss of time to the patient in three, four or five sittings.
2. The coagulation and its after-effects are painless.
3. Although portions of the tonsil may remain after treatment, they are sterile.
4. The remains (which apparently are tonsillar) are generally nothing more than granulation tissue.
5. The results of coagulation by diathermy do not bring about "bottling up" of the crypts.
6. In the United States of America almost all tonsils are now enucleated by means of diathermy.

The above incorrect statements have appeared in print, and throat surgeons are hearing them quoted by patients who have previously consulted practitioners of the diathermy method and who have come to the throat surgeons mainly for the relief of symptoms that not only have continued after, but frequently have been made worse by this treatment.

In a recent letter which appeared in the columns of our journal[2] the question was asked: "Why should tonsils be removed completely?"

This contribution, I trust, will answer the question in a satisfactory manner and in addition refute the various statements quoted above.

Investigations.

A series of seven enucleated tonsils had previously been treated by diathermy coagulation. Three of these were subjected to microscopical examination, three to culture for organisms, and the remaining one to both processes. As all instances produced much the same evidence, further investigations in this direction were considered unnecessary. The patients concerned in the investigations were, as it happened, typical of certain types of focal infection, and each was given a set of questions to answer. As will be seen, one patient had no complaint about the treatment, except that the tonsils were still present and needed enucleation. A useful purpose will be served in detailing these cases.

Illustrative Cases, with Comments.

CASE I.—A male, aged twenty-five, was examined by me some months after an attack of faucial diphtheria and advised to have his tonsils enucleated because he had been subject to sore throats for many months and had been losing weight. Six months later, accompanied by his father, he again consulted me. The father was much concerned about the physical and the mental states of his son, for the young man had "lost a lot of weight and had become a nervous wreck". His systolic blood pressure was below 100 millimetres of mercury. I was informed that in the interval the patient's tonsils had been treated by five applications of diathermy. Before treatment the practitioner had informed him that it would be painless and that the tonsils would be completely destroyed in five sittings. Being a "nervy" type, he was very upset by the first treatment, which caused him much pain, and this persisted for several days afterwards. He dreaded each subsequent application. When last seen by the practitioner in question, he was assured that his tonsils had been completely destroyed. Upon inspection a large amount of tonsil remains was seen and there was a marked faucial band of congestion around each tonsil, demonstrating that septic absorption was still taking place. Moreover, pus was obtained upon expression. In spite of his "nervous" condition, his tonsils were enucleated by dissection under a synergistic analgesia of a barbitone derivative, morphine and local anæsthesia ("Percaine") without any distress. When seen a month later, he had put on half a stone in weight. The latest report received from him is that "he has never felt better in his life". Figures IA and IB are photographs of tonsils removed from this patient. Figure IA clearly shows the scarring on the surface, particularly in the region above A, which "bottled up" some of the crypts. Figure II shows in a clear manner the microscopical appearance in the region of the "capsule" and it is worthy of note that the minute subacute abscess formations are situated in the loose areolar connective tissue outside the dense fibrous tissue constituting the "capsule". The condition may be described as one of peritonsillar multiple minute subacute abscesses.

In an instance such as this, it is obvious that any treatment short of total removal, especially if it produced scarring, would serve to aggravate the condition by "bottling up" and would lead to an increase in absorption. The patient's rapid improvement, both physical and mental, which followed enucleation by dissection, emphasizes the serious

effect of the failure of the former practitioner to complete his task. It emphasizes, in a still greater degree, the necessity in this instance of complete removal of the scarred tonsil remains.

CASE II.—A female nurse, aged twenty-six, attendant to a group of consulting surgeons, was referred to me by her dentist regarding multiple apical abscesses of the upper alveolus because it was suspected that some of them were possibly involved with one of the maxillary sinuses. It was noticed that she was anæmic and thin, and her face was covered with chronic "pimples". The information that her tonsils had been treated by surgical diathermy some months before was elicited. Much scarring was seen on the surface of the tonsils and a large amount of tonsil tissue still remained, which, upon expression, produced a considerable amount of *débris* and pus. I advised enucleation of her tonsils in addition to treatment of her dental condition. Both processes were carried out under "Percaine" local anæsthesia. The tonsils were enucleated fourteen days after the operation upon the alveolus. Her statement is as follows:

> I cannot remember that the doctor who used this method assured me that there would be no pain or that the tonsils would be completely removed. After having six treatments I was told to report to him in four months' time. I failed to do this. I had very little pain or discomfort, either at the time of application or following the treatment, and I was always able to enjoy my next meal in comfort; in fact, I suffered so little inconvenience that I did not mind having the treatment at all. In view of this fact, I would much rather have my tonsils treated by diathermy as far as the comfort of the treatment is concerned, but I realize that, as far as the result is concerned, removal by the surgical method is the only way. Since you have performed this operation my general health has improved considerably and I have gained almost a stone in weight. I am very grateful to you.

This patient is one of the few I have seen who have not complained about the discomfort or pain following the treatment, but from appearances of the tonsils it is assumed (justly, I think) that in this instance very little coagulation was performed at each sitting. This is as it should be, and is in accordance with the teaching of McKenzie and other leading experts. The failure in this instance was in not continuing treatment to the end. However, from the appearances of the tonsil remains seen in other patients who have received treatment by the same practitioner, I cannot help believing that he either does not realize the extent of the tonsil or that he considers it is unnecessary to remove it completely. He has even made the absurd statement (I am informed) that what appears to be tonsil remains are only granulations. McKenzie states that the treatment might have to be carried out every week or fortnight for three, four or more months, and that it requires considerable skill to perform it successfully. In a personal communication he quotes a case which he "diathermized and took a year to do it". Figure III is the macroscopical appearance of a tonsil from this patient as viewed from its "capsular" surface. The microscopical details are described by Dr. Duhig and are portrayed in Figures IV, V, VI and VII. One naturally asks the question: "Did the course of diathermy treatment have any influence in stimulating the epithelial hyperplasia which is seen in this specimen?"

The microphotographs (Figures VI and VII) show that although there was a considerable amount of necrosis and aseptic tissue replacement, there was still much active lymphoid tissue. The sections particularly illustrated that it is the deepest portions of the tonsil, namely, the parts adjacent to the fibrous tissue ("capsule") which especially escape destruction by incomplete diathermy treatment. The marked improvement in the patient's condition in all respects after enucleation of her tonsils is sufficient proof that nothing but their total removal would suffice in her case.

CASE III.—A professional woman, aged twenty-nine, suffering from chronic toxæmia and an "unhealthy throat", had her tonsils treated by diathermy three years before consulting me. Her doctor informed her that he could and would completely remove each tonsil at one sitting. She submitted to treatment and suffered excruciating pain at the time and for three weeks afterwards she had great difficulty in swallowing. She also suffered from a foul breath, a bad taste and lack of sleep. The tonsils were treated singly with an interval of several weeks between the sittings. She still had "an unhealthy throat" and was obviously toxæmic. At inspection a large amount of tonsil tissue was still present on each side. Upon being questioned about this, she stated that the doctor had said that any tonsil remains had been sterilized by the diathermy process. When asked to answer in writing certain questions, she wrote as follows:

> Owing to the fact that the doctor who treated my throat previously is a personal friend of my father's and has been consistently kind to our family for many years, I do not feel free to answer the questions asked by your secretary. Such details would make my case recognizable by him, should he ever read or hear the information you gather on the subject.

The relationship between patient and doctor being so intimate as it is in this case, one can justly assume that the practitioner conscientiously believed that his first statement was correct, and later, when he discovered that it was not correct, repeated another phrase of the selling agent, believing the same to be true.

It is worth remarking that in the scarred area of the tonsil remains where the lymphoid tissue appeared to have been completely destroyed and where the fibrous tissue replacement was two or three millimetres in thickness, the epithelium was hyperplastic and there were prolongations into the deeper tissues. There was dense fibrous tissue replacement, and in the removal it had been necessary to cut through muscle of the tonsil bed. Lying between the muscle and fibrous tissue, and also scattered about the latter, were germ centres of lymphoid tissue and even some lymphoid follicles. Cultures from the sub-"capsular" regions of this tonsil remains yielded a pure *Streptococcus hæmolyticus*; one culture was taken from the region of the fibrous tissue remains to which I referred above.

Regarding this question of tonsil sterilization, McKenzie has much to say. He states that the improvement in the general and local conditions of the patient may be so great after the early applications that patients may consider further treatment unnecessary. He writes: "So much improvement indeed may attend the early applications that it may be difficult to persuade patients

to pursue the treatment to its logical end in complete eradication." He points out "the immediate improvement is due to what is but a temporary sterilization of the tonsil, and that if some tonsil tissue be left it will almost inevitably become infected again later on and lead to a return of the old symptoms". He emphasizes that the diathermist "must be careful in his operating not to leave crypts and cavities covered over and sealed up, or the infection and toxic absorption will continue to be a source of trouble". Speaking personally, he says: "My own practice, ruled as it is by logic and what seems to me common sense, is to remove all the tonsil tissue as completely as possible."

The accompanying microphotographs demonstrate the various points brought out by these remarks.

CASE IV.—A young woman, aged twenty, showing marked evidence of chronic toxæmia, makes her written statement as follows:

> Acting on the advice of my doctor, I consented to have my tonsils removed by diathermy treatment. At the end of each application I had severe pains up into my ears. After about five or six visits I was told my tonsils were removed. Notwithstanding this, I still had the pains, not only into my ears, but at times up the back of my neck. These pains also considerably interfered with my night's rest. I put up with this for some time, naturally expecting that I would eventually get relief, but as there was no improvement after about three months, I went to another doctor, who told me that all the tonsils had not been removed. He treated me by the same method, which gave temporary relief. Subsequently the pain returned, also sore throats and objectionable breath. I suffered this for about twelve months and then consulted a specialist (R. Graham Brown). To my astonishment, he stated that there were still two large pieces of tonsil left, which were "septic". I at once decided to allow him to remove them, which he did by a local anæsthetic. Although only a local anæsthetic was used, the operation was not only painless, but I was practically unaware of its progress. Apart from the throat being sore and a slight restlessness during the first night, I suffered no ill effects, finding the after-effects much less painful than the diathermic way. All my head and ear pains disappeared, and after the soreness wore off I gained more vitality and now feel more fit physically than I have since the diathermy application.

What more convincing tale could be told? Two practitioners of the diathermy method both said at different periods that they had totally destroyed both tonsils, yet much tonsil tissue still remained. Cultures were taken from the deepest portions of the enucleated remains, after the method which is described later by Dr. Duhig, and pure cultures of *Streptococcus hæmolyticus* were obtained.

I contend that the presence of such a virulent organism in the sub-"capsular" region of this patient's tonsil remains was serious enough, but it was a much more serious matter when there was a "bottling up" of such an infection following diathermy treatment. After enucleation of the tonsil remains this patient rapidly regained her former vitality and healthy appearance.

CASE V.—A young man, aged twenty, was referred to me by a general practitioner because he was suffering from subacute multiple articular rheumatism which appeared soon after the commencement of a course of treatment of the tonsils by diathermy over a period of twelve months. It was two months since the treatment had ceased, and there had been no abatement of the condition. Upon examination there was much tonsil tissue evident on both sides, and definite faucial bands of congestion. Pus and *débris* were freely expressed from both tonsils. Upon my advice he submitted to enucleation of the tonsil remains, which operation was performed under local anæsthesia. Cultures were made after the method described by Dr. Duhig and yielded pure *Streptococcus hæmolyticus*. Following the operation the patient suffered a "flare-up" in several joints, associated with a rise in temperature. These gradually subsided and he eventually lost all pains and swellings in the affected parts.

In this instance it is fair to assume that there is a definite relationship between the processes following the diathermy treatment and the subsequent "bottling up" of the crypts ("sealed up crypts" as McKenzie expresses it) and the onset of the rheumatic articular involvement. The growth of such virulent organisms in the deepest portions of the tonsillar remains indicates the seriousness of the position and the necessity of complete removal, be it by surgical dissection or by diathermy coagulation.

CASE VI.—A man, aged forty-seven, having the symptom of severe asthma, consulted me and gave the following details. Two years previously he developed a chronic cough which distressed him at night. Upon consulting his medical adviser, diathermy coagulation of his tonsils was recommended and he underwent treatment. He had five applications to each tonsil over a period of two months. While he was undergoing this treatment his cough became worse and he developed severe asthma, from which, except for one period of remission, he had suffered ever since. Upon examination of his fauces the tonsils appeared to have been totally destroyed, leaving a thin layer of pliable fibrous tissue. However, upon expression with a tongue depressor from without inwards, *débris* and pus were obtained from several small openings which led into small cavities. The patient was also suffering from chronic "catarrhal", polypoid, antral, and ethmoidal sinusitis, and after this diseased state had been corrected I advised removal of his tonsil remains by dissection, and this was performed under local anæsthesia. The surface of the tonsil remains upon examination appeared to be a mass of fibrous tissue, but upon examining the deep surface of the left one, a normal "capsule" was present in the region of the upper pole, and its thickness here was about five to six millimetres. Upon eversion and expression much *débris* and pus were obtained from this region, and cultures taken from the sub-"capsular" region in the manner described by Dr. Duhig yielded a pure growth of *Staphylococcus aureus*, which Dr. Duhig has generously considered might possibly have resulted from contamination. The total length of this specimen was 26·4 millimetres. The width of the upper pole remains was 10 millimetres and the length eight millimetres, and this latter part was covered by normal looking "capsule". Microscopically, adenoid tissue was present in small masses distributed throughout the fibrous tissue of the lower two-thirds or so of the tonsil remains. This patient's written replies to questions were as follows:

> The doctor undertook to completely remove my tonsils. He said that there would be a certain amount of pain, but that diathermy was far less painful than removal by cutting. He assured me at the last inspection that the tonsils had been completely destroyed. (I am sure he really believed they were.) About seven hours after each treatment I suffered from a very dry, painful throat, the pain increasing in intensity and reaching its peak period at noon on the following day; this was accompanied by a feverish condition. I was also troubled with ten to fifteen minutes of acute earache after eating on the third and fourth days after treatment, although only very soft food, such as junket, jelly *et cetera*, was taken. The discomfort lasted about seven days.
>
> During the second and third treatments I was troubled with bleeding from the throat.

After the first treatment I dreaded the subsequent ones.

I had no improvement in my health after having my tonsils removed by diathermy.

I had no pain whatever during the subsequent operation upon my throat.

Of the two methods I would prefer to go into hospital and have the tonsils cut, as I experienced no pain with the latter.

It is significant that this patient's asthma appeared during the course of treatment by diathermy. I am more than suspicious that it precipitated the attack.

Regarding the onset of severe focal infection symptoms during the course of treatment by diathermy, a urological colleague related to me the following details.

He was called to attend a male patient suffering from severe hæmaturia which began during the course of surgical diathermy of his tonsils and which had been aggravated by treatment. The condition became so grave that it was necessary to open the bladder to remove the large clot which was retained there, after which the hæmaturia subsided. My colleague is convinced that the diathermy coagulation of this patient's tonsils precipitated, if it did not actually cause, the attack of acute hæmaturia, and he strongly advised removal of these structures by dissection as soon as possible.

With reference to the absurd statement that in America the method is practically the only one now used in removing diseased tonsils, I wish to state that during my attendance at the annual meeting of the American Medical Association in Philadelphia in June last year, there were among the list of operations at the sittings of the Section of Oto-Rhino-Laryngology some for diathermy of the tonsils. These were included in order to demonstrate the method to the members of the section. The demonstrator said he preferred to enucleate the tonsils by dissection, and the opinion held unanimously, as far as one could judge, was that treatment by diathermy should be used only in specially selected cases. I visited many centres in America, and nowhere did I meet with throat surgeons using this form of treatment. It may be appropriate to quote here the summary of an editorial of *The Journal of the American Medical Association* which appears in *The Laryngoscope* of January, 1932, upon this question.

There is an editorial in the September 19, 1931, issue of *The Journal of the American Medical Association* on the electro-surgical removal of tonsils. The editorial stresses the importance of choice of case for electro-coagulation. Much has recently been written about this method, and it is undoubtedly gaining popularity in the hands of the general practitioner, the surgeon and the border-line specialist. Manufacturers of the instruments are partially to blame for the unwarranted popularity because of their excessive claims of advantages. Tonsillectomy should still be considered a major surgical operation, and in competent hands, in indicated cases, there is no doubt but that electro-coagulation is of service; however, the feeling prevalent today among the recognized specialists is that electro-coagulation is merely another valuable adjunct to the armament used in tonsillectomy.

It is my opinion that the practice of diathermy of the tonsils has been very much overdone, but that when the bad effects of incomplete treatment have been brought home to practitioners in general, it will gradually take its proper place in the treatment of diseases of these structures.

Clinically and surgically there are two types of tonsils: (*a*) The greatly enlarged tonsils whose greatest part by far is on the surface with a small, deep portion, which can hardly be called "buried". (*b*) The smaller "buried" tonsils, the most of whose mass lies deep within the pillars of the fauces.

The former are generally comparatively harmless, whereas the latter are often the heaviest carriers of infection. Incomplete diathermy treatment may suffice in the former, just as tonsillotomy does in a certain number of patients, but in the latter no treatment short of complete removal should be advocated for fear of greatly increasing the septic absorption from these structures. It is an easy matter to electro-coagulate the former type of tonsil, but to do so in the latter requires the highest knowledge and skill, and last, but not least, utmost patience.

In concluding my contribution to this discussion I may be excused for pointing out that the standard of tonsil surgery existing today is very much higher than it was a few years ago, and general practitioners are rapidly acquiring experience which almost, if not quite, places them on a level with throat specialists in this department of their work. I feel that it is in this direction that we must look for advancement in treatment of tonsil diseases by the general practitioner and not by the methods of diathermy coagulation, electrolysis and such like aids to questionable easier treatment.

The Pathological and Bacteriological Aspect (J. V. Duhig).

Any technique must be judged by its result in attaining the object aimed at, not necessarily by what its partisans say it ought to do. The test is, does it do it, infallibly, in good hands? My opinion about diathermy of tonsils is founded solely on that basis, since I have no clinical knowledge of the procedure, either as subject or operator, nor would I found any opinion on any macroscopical view of results. On the limited experience set out in this communication, I would think a macroscopical view of results a fallacious guide. I do not now think it possible to estimate the success of the technique in any given instance by just looking at the result. As will be seen later on, what looks like a fibrosed residue of perfectly diathermied tonsil may conceal the makings of future mischief. My experience in this matter, then, is solely that I have examined, histologically and bacteriologically, tonsils removed in the traditional way by surgical operation from seven patients after diathermy is supposed to have done its best to destroy these tonsils.

The objects of diathermy, I have been told, are: (i) To destroy the tonsil, that is, to destroy the mucosa, lymphoid tissue and connective tissue and all they contain; and (ii) to render the fibrous residue sterile.

The material which I have examined was first treated by diathermy. It was later thought advis-

able to remove the remnant surgically. This was given to me to examine. All the histological preparations, numerous sections from five patients, showed an abundance of lymphoid tissue arranged in the way usual in tonsils; that is to say, the ordinary architecture of the tonsils was not, in general, disturbed. In three cases the epithelium covering the tonsil was not only still present, but was hyperplastic, amounting in one case to almost a condition of neoplasm. In its primary object, then, if I apprehend it rightly, the procedure failed in all the specimens I examined. Details of the failures are here set out.

Specimen 1 (Figure II).—In general structure there has been no alteration. There is abundant lymphoid tissue, apparently normally functioning, to judge by the blood vascular, reticular and endothelial elements; normal squamous epithelium covers the organ on the free aspect, and a connective tissue "capsule" on the deep side. The tonsil, however, was chronically inflamed, and under the "capsule" in one section there are to be seen at least two small subacute abscesses and one area of old chronic inflammation (Figure II). This last has fibrosed, whether as a result of diathermy or chronic irritation it is difficult to say. As there is no other sign of the influence of diathermy in nearby or other parts of the organ, it is more likely the result of chronic irritation.

As this and Specimens 2 and 3 were mounted in preserving fluid before I got them, no attempt to obtain bacteriological cultures from them was made.

Specimen 2 (Figure IV).—Specimen 2 showed an indication of what diathermy might do if carried to the bitter end. Of a complete cross section fully two-thirds of the area was completely necrosed and replacement fibrosis was going on. On the other hand, the epithelial covering of the organ was still intact and, with the serious exception of one area, apparently healthy. Just beneath this there was much lymphoid tissue with active germ centres. There was much of interest to be seen at the base of the tonsil where it is attached to the fibromuscular tissue between the pillars. And, incidentally, this is the area which diathermy, incompletely done, seems specially to miss and which a careful pathologist should always examine in investigations of this kind. The photomicrograph (Figure IV) shows the epithelium surrounding a crypt cut across, and within it a mass of that caseous, necrotic, smelly *débris* which may be squeezed out of chronically inflamed tonsils. Figure V shows the Malpighian layer of a strand of epithelium which is hyperplastic and possibly neoplastic. In any case the original owner is fortunate to have lost a possible site of cancer in later life. Hyperplastic epithelium of this kind occurred in two other tonsils of the series examined, and I make a few remarks on what possibly may be a significant finding.

Other features in this specimen are depicted in Figures VI and VII, which show the effects, good and bad, of diathermy. Figure VI shows that necrosis and replacement fibrosis of an aseptic kind have truly occurred, but the effect is patchy, and unfortunately the fibrosis underlies a healthy mucosa while beneath the fibrosis is actively functioning lymphoid tissue with vascular supply and drainage intact. One can conceive such a condition as that figured (Figure VII) leading to a blind abscess shut off from the likelihood of free and easy surface drainage should infection of the deep lymphoid tissue occur, unless, of course, ulceration through the mucosa took place, or some other change, all of which diathermy was supposed to prevent. Looking at things as they are, I should say that in any case sepsis would first be "bottled up" for some time.

Specimen 3.—Specimen 3 showed features similar to those figured and the usual follicular tonsillitis at the base (Figure VIII).

Specimen 4.—Specimen 4 seemed to be the nearest approach to complete fibrosis of the series examined. Macroscopically the tonsils were narrow, firm fibrous cords, but on section they contained apparently normal lymphoid tissue similar to that seen in Figures III and VII. After examining this specimen I would not again be prepared to guarantee the absence of lymphoid tissue, that is, to guarantee the destruction of a tonsil, on the naked eye view alone. And unless the tonsil is destroyed, freedom from sepsis cannot be assured, for this last specimen was cultured with a positive result.

Specimen 5.—Specimen 5 retold the story which by this time was becoming a little tiresome. In this case we sectioned one tonsil at either pole and found the expected result. At the upper pole there was a fairly good result; not more than a fifth of the area sectioned was unaltered, and for the rest there was good sterile necrosis. But at the base, just as before, there was little change in the architecture of the organ and, curiously enough, a hyperplasia of the mucosa amounting by actual measurement to five times the depth of the normal neighbouring mucosal average. Here again conditions favourable for "bottling up" were found.

Specimens 4 and 5 and two others were examined bacteriologically. All yielded growths. The technique was to sear the newly excised gland with a very hot knife, which was further used while still hot to open up the substance of the gland. The idea was, of course, to sterilize the whole depth of the track the inoculating needle was to take. Cultures were made at random from areas thus exposed. One yielded a *Staphylococcus aureus*, which might be a contaminant, though in that rôle this organism is rare. There was no doubt about the other three.

One was markedly hæmolytic on human blood agar, and according to Holman's classification was *Streptococcus pyogenes*. The next was also hæmolytic and was classified (Holman) *Streptococcus anginosus*. The third gave a streptococcus from both tonsils and from two places in the left tonsil. On blood agar the streptococcus from the left tonsil was hæmolytic, that from the right was not.

The specimens of tonsil examined were not, so far as I know, specially selected material, but

amounted to random samples of "diathermied" tonsils requiring surgical removal, occurring casually in a surgical practice. As "diathermied" tonsils presented themselves, they were removed if necessary and examined in unbroken series. In all seven cases the treatment by diathermy was claimed by the practitioner of that technique to have been complete in each case, so I have been told.

Now it is quite evident that in the material examined the objects of diathermy were not fulfilled. Only partial destruction of the gland took place and from what was left behind certain conclusions can be drawn.

First, that it is very difficult to decide that extirpation of the tonsil is complete if reliance is placed on the naked eye appearance of the field. As a corollary, unless destruction is complete, it is possible to leave sepsis behind in the lymphoid residuum. And if this septic focus is capped on the buccal side, as is shown in the pictures, by fibrous tissue, a blind abscess may form, much in the same way as infected sebaceous cysts remain blind foci of troublesome infection if allowed to heal over the surface after the abscess bursts or is opened. If such an abscess is latent and adjacent to vessels, as in Figure II, opportunities for mischief seem adequate.

Next, in three of the specimens examined, with a very liberal allowance of the limit of normality, the mucosa seemed to be in a condition which surpassed what might be judged normal. I cannot interpret this finding either against diathermy as an ætiological agent in the matter, that is, as a chronic irritant, or as due to some other cause independent of the diathermy. For the present I am content to record the juxtaposition and look for confirmation or denial in a very large series. At present it would be perilous to draw any conclusion other than that this might be a deciding reason against the use of the procedure in any given case. I must also record as an interesting fact that these details of failure are to be most often found at the base of the tonsil, as if some defect in technique were constantly operating, a defect, be it noted, common to more than one worker and either inherent in the procedure or in the anatomy of the part. Either way the procedure suffers as a counsel of virtue. If the obstacle to perfection is anatomical, which seems to me a likely hypothesis, it seems, moreover, that the technique would serve best in the hands of somebody familiar with the anatomy of the part, to wit, the oto-rhino-laryngologist.

So that, in so far as the evidence is valid, and I see nothing to indicate it is not valid, diathermy is liable to fail in its objects of destroying the tonsil and rendering the residue sterile.

All the material was supplied to me by Dr. Graham Brown, whose unfailing interest was very stimulating; to Miss Gwen Jones my best thanks are due for preparing the sections illustrated.

CONCLUSIONS.

From the foregoing remarks and evidence, it is claimed that the statements made by certain enthusiasts of diathermy destruction of tonsils are refuted. For some time the authors have been and are still satisfied that total removal of the tonsils by electrocoagulation can be performed almost painlessly and with practically no subsequent discomfort, but only provided a little destruction is done at each sitting. Likewise, satisfactory results can only be expected provided the operator possesses a thorough knowledge of the anatomy of the tonsil and its surroundings, and that he has the necessary expert skill to manipulate the electrode and to manage his patient. In other words, it is a class of work for the expert throat surgeon. In addition, a degree of patience, which is seldom found in patients and still less in surgeons, is a necessary requirement if the process of destruction is to be carried to its satisfactory conclusion. Speaking generally, this perfect result seems seldom to be attained.

REFERENCES.

(1) R. Graham Brown: "Chronic Tonsillitis and Its Surgical Treatment", THE MEDICAL JOURNAL OF AUSTRALIA, October 10, 1931, page 444.

(2) THE MEDICAL JOURNAL OF AUSTRALIA, March 12, 1932, page 389.

LEGENDS TO ILLUSTRATIONS.

FIGURE IA.—Tonsil, viewed from the superficial or internal aspect, which was dissected out after claimed total destruction by diathermy. Superficial scarring of tonsil is well seen, and many crypts are "bottled up". These on expression produced considerable *débris* and pus. The lower portion of the tonsil has been completely overlooked by the diathermy practitioner. A = pseudo lower "pole", B = lower lobe, D = pharyngeal branch.

FIGURE IB.—View of the companion tonsil removed by dissection after claimed total destruction by diathermy. The superior pole is seen to be complete and does not appear to have been touched by the destructive process. From this aspect it can be understood how such a tonsil would appear to the untutored to be destroyed, for it was lying hidden under the pillars of the fauces. This example emphasizes the need for defining the limits of the tonsil before and during treatment. A = pseudo lower "pole", B = lower lobe, D = the pharyngeal branch, C = capsule over upper "pole".

FIGURE IC.—Rough drawing showing the position which the tonsil remains (Figure IB) occupied on the left side of the palate. This illustration emphasizes the importance of determining the depth of the tonsil.

FIGURE II.—A = normal lymphoid tissue, B = "capsule", C = subacute abscess, D = fibrosis at site of old abscess, E = normal "pericapsular" alveolar tissue.

FIGURE III.—External or deep view of tonsil removed by dissection after partial destruction by diathermy. B = lower lobe, C = capsule, E = equator. Macroscopically the capsule appears normal, indicating that the diathermy process was well removed from this region.

FIGURE IV.—A = caseous *débris* in tonsillar crypt, B = subepithelial inflammatory exudate present all around crypt.

FIGURE V.—A = hyperplastic tonsillar mucosa seen in centre of section, B = round cell infiltration surrounding column of epithelial mass.

FIGURE VI.—A = normal epithelium, B = normal lymphoid tissue, C = diathermy effect, necrosis and replacement fibrosis.

FIGURE VII.—A = healthy epithelium at surface, B = replacement fibrosis, C = healthy lymphoid tissue. (From same tonsil as Figure IV.)

FIGURE VIII.—A = plug of necrotic material in intact tonsillar crypt.

FIGURE IX.—Low magnification of a frozen section through the thinnest part (9·4 millimetres in depth) of the "scarred" remains of the left tonsil removed from Case III. a = hyperplastic epithelium, b = inflammatory exudate, c = fibrous tissue (remains of "capsule"), d = lymphoid tissue (germ centre), e = muscle bundle, f = glands.

A REVIEW OF ONE HUNDRED AND FIFTY CONSECUTIVE AUTOPSIES ON THE INSANE, WITH SPECIAL REFERENCE TO THE RELATION OF PHYSICAL LESIONS TO MENTAL SYMPTOMS.[1]

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IN a mental hospital the treatment of physical disease plays a considerable part in the routine duties of a medical officer. Although mental patients are in many ways more protected from infections than the average sane person, this is counteracted by the faulty habits of many of them, and the general metabolic retardation which is a feature of many mental cases. Some patients are suffering from organic disease when admitted, and we have often to consider what part, if any, this plays in the production of the mental state of the patient. The question of the relation of physical disease to mental abnormality is an interesting one, and has perhaps not received as much attention in the past as it merits. It is in an attempt to throw some light on this subject that this review is being presented.

There is no doubt that the rational functioning of the mind is dependent upon the normal functioning of brain cells, and these cells, being highly specialized, are, in common with other highly specialized cells in the body, delicately constructed and sensitive to adverse conditions. They can be affected by numerous factors, such as trauma, toxins, changes in temperature, insufficient blood supply *et cetera*. There are numerous physical diseases in which the associated nervous symptoms are widely recognized, these symptoms undoubtedly resulting from damage to, or impairment of function of, nerve cells. The medical practitioner commonly observes the mental symptoms occurring in general paralysis of the insane and cerebral syphilis, and those associated with endocrine disturbances, for example, in toxic goître, or at the climacteric. The mental symptoms occurring in delirium associated with pyrexia are, of course, familiar to all. There can be no doubt that physical and mental diseases are commonly closely related, and it seems probable that there may be a physical basis in a much larger percentage of cases of mental disorder than is generally realized.

All of our patients were, of course, psychotics; no examples of the neuroses or psychoneuroses are included in this paper. The review is based upon the work of the medical officers of the Claremont Hospital for the Insane, consisting of Dr. J. Bentley, Dr. E. J. T. Thompson, Dr. R. G. Williams, Dr. G. Bury and myself. By means of free cooperation and discussion we have endeavoured to eliminate, as far as possible, any personal prejudices, realizing that in a subject of this nature the personal factor is only too likely to distort the picture.

[1] Read at the annual general meeting of the Western Australian Branch of the British Medical Association on March 20, 1932.

The Technique of Post Mortem Examination.

These 150 *post mortem* examinations have not been carried out with the express desire to discover physical lesions which might account for the mental condition of the patient during life. With few exceptions a *post mortem* examination is held on every patient who dies in this institution, providing the permission of the relatives can be obtained. Each autopsy is carried out in a routine manner, and the technique is worthy of a brief description.

After the thorax and abdomen have been opened in the usual manner, the anterior layers of the great omentum are incised along the greater curvature of the stomach, and the transverse colon is freed. The first loop of the jejunum now presents, and after being double ligatured, is divided. The duodenum is freed throughout its length. The peritoneum is incised over each kidney and these organs are mobilized, the ureters being cut, but the pedicles being left intact. The abdominal aorta and *vena cava* are cut through immediately above the bifurcation and freed as high as the diaphragm. The diaphragm is now incised round its periphery. The larynx is mobilized and separated by an incision through the thyreo-hyoid membrane. The great vessels of the neck are cut, and the lungs freed if adhesions are present, after which the crura of the diaphragm are divided. At this stage, by grasping the larynx and exerting traction in a downward direction, a "block" can be removed, consisting of the trachea, lungs and air passages, the heart with the whole of the aorta, the œsophagus, stomach, duodenum and pancreas, the spleen, liver, kidneys and suprarenal glands. This "block" is now examined, the various organs being incised and inspected. The intestines are then removed and the pelvic organs examined. The brain is removed, attention being given to the condition of the membranes and the pituitary and pineal glands. The ventricles are closely inspected. The brain is then sectioned in the usual manner. A detailed record is kept of every autopsy, and it is from these that the subject matter for this review has been obtained.

Mental Disorder Due to Physical Lesions.

According to the intimacy of the relationship between physical lesions found *post mortem* and the mental symptoms present during life, the cases have been divided into three groups. Into Group I have been placed those in which there have been physical lesions which could quite definitely have caused the mental symptoms. This group has been subdivided into (*a*) those cases in which there have been congenital macroscopical lesions regarded as sufficient to cause the mental disorder, and (*b*) those in which there have been macroscopical lesions other than congenital, which have been regarded as sufficient to cause the mental disorder.

Mental Disorder Due to Congenital Lesions.

Now let us consider two representative cases from Group I, Section (*a*).

CASE I: Number 141, a male child, aged two and a half years, was admitted as a microcephalic idiot. He was entirely dependent and showed no attempt at walking or talking, and was anæmic and occasionally showed a tendency to opisthotonos. He was one of premature twins; the other was still-born. The mother had suffered from eclampsia.

The child died as the result of a subacute generalized tuberculosis. On *post mortem* examination there was found to be a very great increase in cerebral fluid and maldevelopment of both frontal and occipital lobes of the cerebrum, the cortex being markedly trabeculated. The mesial surfaces of both frontal lobes were softened, the lateral ventricles were greatly dilated, and there was a

slight pachymeningitis over the right temporal lobe. There was recent tuberculous bronchopneumonia of both lungs with tubercles in the kidneys, spleen, liver and intestines.

CASE II: Number 137 in the series is also assigned to Group I, Section (*a*). He was a male, aged fifty-six years, suffering from insanity with epilepsy. He was quite demented, childish, amnesic and totally disorientated, and was frequently restless and noisy. He showed various stigmata of degeneration. He died as the result of peritonitis following the perforation of a typhoid ulcer. On *post mortem* examination the skull was found to be grossly thickened, with large air spaces between the inner and outer tables. The frontal sinuses were very extensive, and the body of the sphenoid was merely a thin-walled cavity containing pus. There was a small fibroma adherent to the *dura mater* over the orbital plate; it had caused a depression on the under surface of the frontal lobe of the cerebrum. The convolutions were flattened and abnormal in contour, but the cerebral vessels were in good condition and there were no cerebral softenings. There were typhoid ulcers in the ileum; the spleen was congested, and there was septicæmic staining of the endocardium.

Mental Disorder Due to Lesions Other Than Congenital Lesions.

Group I, Section (*b*), is most significant from the point of view of our investigation, and five cases have been chosen as being demonstrative.

CASE III: Number 109, a male, aged fifty-six years, was admitted suffering from general paralysis of the insane. He was confused, disorientated and demented, noisy, restless and incontinent in habits. He had paresis of both legs; the knee jerks were absent and Babinski's sign was present on either side. His speech was slurred and there were marked tremor of the tongue and involuntary movements of the limbs. The blood Wassermann reaction was positive, and by examination of his cerebro-spinal fluid a Lange colloidal gold curve of 555543210 was obtained . He rapidly deteriorated both mentally and physically. On *post mortem* examination the *dura mater* and pia-arachnoid were seen to be thickened, and the internal carotid arteries were dilated but not atheromatous. The lateral ventricles were dilated and showed marked "frosting", and the brain was generally wasted. The spinal cord was also extremely narrow and wasted. Both lungs were œdematous; the heart was enlarged, and there were signs of an old pericarditis. The aorta was atheromatous, particularly the ascending portion and the arch. There were perihepatitis and some cirrhosis of the liver. The left kidney was hydronephrotic and the right pyelonephritic.

CASE IV: Number 110 was an example of psychosis associated with cerebral syphilis. He was a male, aged forty-one years, who had a history of mental disorder for three years and four months. On admission he was depressed, confused and irrational, and admitted having attempted suicide. Later he developed fantastic delusions which were supported by hallucinations, and he was frequently noisy, excited and violent. He admitted having had syphilis twelve years previously and that he had received injections. Neither the blood nor the cerebro-spinal fluid reacted to the Wassermann test. He died from lobar pneumonia.

At *post mortem* examination the *dura mater* was found to be markedly thickened and there were calcareous plaques in the *falx cerebri*. The pia-arachnoid was greatly thickened and vascularized and studded with white patches, the result of an old meningitis. There were marked submeningeal œdema and a hyperæmic area in the left occipital lobe of the cerebrum. There was some "frosting" of the lateral ventricles and of the floor of the fourth ventricle. The brain was generally congested, but there were no localized softenings. There was slight atheroma of the arch of the aorta. Perisplenitis was present. The globulin reaction of the cerebro-spinal fluid was "++". There was consolidation of the upper lobe of the left lung and the lower lobe of the right. This man had a very definite meningo-vascular syphilis, although his blood did not react to the Wassermann test.

The following example from Group I, Section (*b*), is a case of mental symptoms associated with a cardiac valvular lesion.

CASE V: Number 134, a male, aged fifty-five years, died as the result of a fracture of the skull and cerebral laceration. He had been depressed and sleepless, subject to delusions of persecution and hallucinations of an unpleasant nature. He became confused and agitated and finally succeeded in committing suicide by precipitation. On admission he was in poor physical condition, and was considered to be suffering from aortic stenosis. His blood and cerebro-spinal fluid did not react to the Wassermann test.

Post mortem examination revealed an extensive comminuted fracture of the skull with widespread damage to the brain. The cerebral vessels were slightly atheromatous. The heart was enlarged, the myocardium of the left ventricle being markedly hypertrophied; the aorta was narrow, but only slightly atheromatous. There was marked stenosis of the aortic valve; two of the cusps were firmly adherent, being joined by a solid fibrous plaque. The other valves were normal. Both kidneys showed signs of chronic nephritis. This man's mental symptoms were considered to be caused by chronic cerebral anæmia.

CASE VI: Number 75 illustrates an interesting case of insanity associated with epilepsy. The patient was a male who had been in the institution for nearly thirteen years. On admission he was irritable, confused, demented and suicidal, and became violent when fits were impending. He became progressively more demented and his speech became slurring. On one occasion he pushed a piece of wire a distance of about four inches into his right hypochondrium. He eventually died of broncho-pneumonia.

At *post mortem* examination there was found to be an excess of cerebral fluid, and the pia-arachnoid was adherent over the frontal lobe, there being several cysts containing fluid in this region. Over the occipital lobe and within the left Sylvian fissure there were brownish coloured cysts, some containing white material and others a brown *débris*. Similar cysts were found embedded under the cortex of occipital, frontal and parietal lobes. They appeared to arise from the *pia mater* occupying the overlying sulci. There were, however, two exactly similar cysts in the left caudate nucleus. The cerebral vessels were not atheromatous and the aorta was in good condition. Both kidneys showed signs of chronic nephritis and there was a healed perinephric abscess on the right side, the gall-bladder, duodenum and omentum being adherent. This was probably caused by the old punctured wound. Both pulmonary bases showed bronchopneumonic patches.

CASE VII: Number 65 was a male, aged sixty-six years, who suffered from mania associated with *diabetes mellitus*. On admission he was noisy and hyperactive, incoherent in speech, and subject to delusions of a persecutory and grandiose nature. He was in poor physical condition, and his blood sugar content after the administration of 25 grammes of glucose was as follows: After half an hour, 250 milligrammes per 100 cubic centimetres; after one hour, 330; after one and a half hours, 340; after two hours, 310; after two and a half hours, 230 milligrammes per 100 cubic centimetres. His blood did not react to the Wassermann test, and he died one month after admission.

At *post mortem* examination an excess of cerebro-spinal fluid was found, with congestion of the meninges and cerebral cortex. There were softenings in both dentate nuclei, and ecchymoses in the fourth ventricle. The pituitary gland was small and deeply placed in the pituitary fossa. The liver was cirrhotic, and the kidneys were enlarged and acutely congested. The suprarenal glands showed marked cavitation with hypertrophy of the cortex. The head of the pancreas was congested and the body and tail were hard and atrophied. The pancreatic vessels were very tortuous and greatly dilated. The heart was small, the myocardium showing vitreous degeneration, and there were bronchopneumonic patches in both lungs.

Mental Disorder Partly Due to Organic Lesions.

To Group II are assigned those cases in which there have been organic macroscopical lesions

which are considered to have contributed towards the production of mental symptoms. No doubt many of these cases belong to Group I, but as there is some doubt as to the extent of the part played by the organic factor, it is considered preferable to place them in this intermediate group.

CASE VIII: Number 113, a male, aged forty years, suffered from manic-depressive psychosis associated with endocrine abnormalities, renal disease and cerebral defects. He died from uræmia seven months after admission to the hospital. On admission he was excited, noisy, irrational, and subject to fantastic delusions of a grandiose type, for example, that he "was just short of being God". He was subject to auditory and visual hallucinations and was dirty in his habits. Later he became greatly depressed, solitary and inaccessible. In another manic attack he became comatose, with flaccid paralysis of both lower limbs. His urine contained albumin. His blood did not react to the Wassermann test.

On *post mortem* examination the meninges were found to be congested, and there were bony plaques in the *falx cerebri*. The whole brain was small, but there were no localized softenings, and the cerebral vessels were only slightly atheromatous. The lateral ventricles were dilated. The pituitary gland was slightly enlarged. The thyreoid gland was greatly enlarged and hyperæmic. There were areas of hyaline degeneration in the tail of the pancreas. The suprarenal glands were embedded in perinephritic fat, and both kidneys were enlarged and congested. There were patches of bronchopneumonia in both lungs.

In this case it is probable that the endocrine abnormality played its part in the production of the mental disorder. The renal condition may also have been contributory.

CASE IX: No. 119 is an example of insanity with epilepsy. A female, aged fifty-five years, had a history of mental symptoms for thirteen and a half years. She was restless, confused and irrational in conversation, given to occasional outbursts of violence, and was subject to delusions of persecution.

Post mortem examination revealed generalized wasting of both frontal lobes, with slight increase in cerebral fluid. The cortex of the frontal lobes was narrow and almost transparent, quite different in appearance and consistency from that of the other lobes. The brain was short in the antero-posterior dimension, and the pituitary gland was small and friable. In both lungs there were signs of tuberculosis with cavitation, and there were tuberculous ulcers in the small intestine, and tubercles on the surface of the spleen.

Mental Disorder Without Apparent Organic Cause.

Group III consists of those cases in which there were no organic macroscopical lesions regarded as sufficient to cause the mental disorder. It will be sufficient if two examples from the group are quoted.

CASE X: Number 59, a male, aged fifty-seven years, suffering from *dementia præcox*, had been certified insane for twenty-seven and a half years. He was solitary, deluded and hallucinated, and became gradually demented and totally dependent. He had a syncopal attack five days before death.

Post mortem examination revealed slight atheroma of the cerebral arteries and small softenings in the left caudate nucleus. There were fluid in both pleural cavities and old tuberculous scarring at both pulmonary apices. The pericardium contained a large blood clot, resulting from a small rupture of the left ventricle, and the myocardium contained many fibrous patches. The kidneys were of the small granular type.

CASE XI: Number 149 was a female patient, aged thirty-nine years, suffering from *dementia præcox* catatonia. She was demented, solitary, negativistic, totally inaccessible, and dirty in her habits. She died as a result of acute pulmonary tuberculosis.

Post mortem the skull and brain were found to be small. Both frontal lobes of the cerebrum were somewhat flattened, the cortex being narrow and the cerebral fluid increased. There were a few tubercles in the pia-arachnoid membrane. There were signs of subacute tuberculosis of the upper lobes of both lungs, with cavitation at the apices. There were recent deposits of lymph on the pericardium and small vegetations on the mitral and aortic valves.

In neither of these cases in Group III was it considered that the mental symptoms could reasonably be attributed to the physical lesions. The cases which have been quoted are considered to be representative ones, and the others in the respective groups are equally typical.

Discussion.

Time does not permit the inclusion of any further examples, but the records are available in synopsis form to any member who would care to inspect them. It is worthy of note that nineteen out of twenty-two cases diagnosed as *dementia præcox*, excluding two with underlying congenital mental defect, have been included in Group III, in spite of the presence of those organic defects so commonly found in *dementia præcox*. Their inclusion in Group III is due to the present uncertainty as to cause and effect, and it has not been felt that there has been justification for attributing the mental symptoms to the atrophic endocrine glands, vitreous myocardium, narrowed cerebral cortex or other organic lesions which have been present.

In the selection of cases for Group I it has been remembered that the majority of the *post mortem* examinations were held on elderly people and that even in a community of sane individuals the incidence of similar physical diseases would probably be fairly high. However, the various factors in each case were carefully weighed before the decision was reached that the mental disorder could reasonably be assumed to be the direct result of the physical disease. It could be argued, for example, that a large proportion of elderly persons suffer from arteriosclerosis to a greater or less degree and yet do not present symptoms of insanity. However, nearly all of the cases of arterio-renal disease which appear in Group I, have presented further evidence, such as localized cerebral sclerosis, softenings, hæmorrhages *et cetera*. When there has been any doubt as to whether the physical factors could be actually causative or merely contributory, the cases have been placed in Group II. The inclusion of a patient in Group III does not imply that there was no organic defect, merely that, if present, it was not considered to have influenced the mental state of the patient.

The figures and percentages assigned to the various groups are set out in Table I.

It will be noted that in 71% of these cases physical lesions are regarded as having played a part in the production of the psychosis, and in 45% the lesion was regarded as sufficient to cause the mental disorder.

TABLE I.
The Numbers of Cases in the Various Groups.

Group.	Number of Cases.	Percentage of Total.		
Group I (*a*)	14	9%	45%	71%
(*b*)	54	36%		
Group II ..	39	26%		
Group III .	43	29%		
Total	150			

If Group I is studied, it is found that the organic factors considered as causative were as follows:

Arterio-renal syndrome	19
Syphilis	19
Congenital cerebral defects	14
Aortic valvular lesions	5
Cerebral tumours	3
Pachymeningitis hæmorrhagica	2
Cerebral lesion due to trauma	2
Diabetes mellitus	1
Pernicious anæmia	1
Cerebral softenings with out arteriosclerosis	1

It would certainly be unwise to draw dogmatic conclusions from a comparatively small number of cases; for in a sequence of this extent the percentages may not be truly representative. However, we feel satisfied that the organic factor is of greater importance in the causation of mental disorder than is commonly admitted.

A synopsis of each case has been kept in tabulated form, entries being made under the following headings: "Number and Name"; "Sex and Age at Death"; "Age on Admission"; "Date of Death"; "Time Spent in Hospital"; "Diagnosis of Mental Disorder, (*a*) on Admission, (*b*) at Death"; "Certified Cause of Death"; "*Résumé* of Mental History"; "*Résumé* of Clinical History"; "*Résumé* of *Post Mortem* Findings"; "Remarks"; "Group".

These records are available to any member who would care to examine them.

Acknowledgement.

Thanks are due to Dr. Bentley, Inspector-General of the Insane, for permission to publish this review, and to the medical officers and staff of the hospital for their kind cooperation and advice.

INTRAVENOUS PYELOGRAPHY: ITS APPLICATIONS AND ITS LIMITATIONS.

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NOWADAYS the wealth of medical literature has become so vast that it is almost impossible for the average practitioner to keep pace with the general advances in his own particular field, let alone those taking place in more highly specialized branches of the profession. Accordingly, I have tried to gather together in this short *résumé* of intravenous pyelography some of the points which may assist in determining whether or not this method will aid in the diagnosis of certain urinary conditions.

History.

The development of the present satisfactory media for the radiological study of the urinary tracts by means of intravenous injection dates back to 1923, when Rowntree discovered that a shadow of the urinary tract could be photographed on an X ray plate after the intravenous injection of large doses of sodium iodide in solution. The inorganic iodine, however, proved very toxic, and the shadow of the renal pelvis, which was sometimes obtained, was so indistinct that the method was abandoned.

Rowntree's work was the forerunner of the discovery of the present media, for it led to the selection of iodine, with its high atomic weight, as the contrast base for urinary tract radiography. Other workers had been investigating the use of the salts of heavy metals as the contrast substance, but without success; but at length Roseno, of Cologne, basing his investigations on Graham's findings in cholecystography, and on those of Rowntree, tried to discover a medium suitable for intravenous injection, having the essential properties of solubility in water and non-toxicity, that would act as a contrast medium easily excreted and concentrated by the kidneys.

Roseno was successful up to a point, for he chose urea as the vehicle to carry the contrast medium to the kidneys, partly on account of its diuretic action in suddenly flooding the urinary system with the medium. He chose the inorganic sodium iodide as the contrast substance, which, by its loose combination with urea, again proved very toxic. This sodium iodide urea combination, which he called "Pyelognost", was almost immediately replaced by a comparatively non-toxic iodine pyridine derivative discovered by von Lichtenberg, Swick and coworkers, which they called "Uroselectan". In this preparation a single atom of iodine is bound directly to the pyridine ring; it is therefore more stable and more suitable for intravenous injection. It has an iodine content of 42%. Seventeen grammes of iodine are therefore given as a normal adult dose, since the dose of "Uroselectan" is 40 grammes dissolved in 100 to 110 cubic centimetres of double distilled water. The solution is sterilized by boiling, carefully filtered and then tested for free iodine.

"Abrodil" is a more recent discovery. It also requires careful preparation before being injected intravenously. In the comparatively recent preparation, "Uroselectan *B*", intravenous injection is greatly simplified. It is also a pyridine derivative containing 51·5% of iodine in close organic combination, and is made up in ampoules containing 15 grammes of the dye dissolved in 20 cubic centimetres of sterile 10% solution of invert sugar ready for injection directly into a vein. Injection of the 20 cubic centimetres must occupy at least four minutes, as the solution is a markedly hypertonic one. Radiographs are taken immediately after the injection, ten minutes, and thirty minutes or longer after the injection. The time of appearance of the contrast substance in the urine depends on the degree of functional activity of the kidneys.

The Clinical Effects.

For the most part the reactions of the patient at the time of injection are negligible; but occasionally slight subjective symptoms appear. A slight burning sensation in the vein of the arm injected, or slight pain radiating up to the shoulder, with a general sensation of warmth, or a sudden increased thirst is all that may be noted. Occasionally, however, one may encounter a case where the slight local pain at the site of injection becomes very severe, and a mild degree of shock develops, with nausea, pallor, tachycardia, cold, clammy skin, weak pulse, and laboured respiration. Siefert reported such a case in 1931, when he was using the original "Uroselectan". He maintains that the majority of reactions are due to marked hypertonicity of the solution injected intravenously and its too rapid injection, and not to any toxicity of the drug in the dosage employed. He advocated a 15% solution of the original "Uroselectan", and in this concentration it has been given to children as well as aged persons without any unpleasant effects. This statement might well apply to the more recent preparations, "Abrodil", "Skiodan" and "Uroselectan *B*", for subjective symptoms occasionally occur during the intravenous administration of these drugs also.

Physiology.

Excretion from the blood stream is carried out by the glomerular filtration system of the kidneys; but should the system be greatly damaged, other organs, notably the liver, eliminate the drug. Excretion of the greater part of the dye is rapid if the kidneys are normal, the percentage excreted rising quickly soon after injection and falling off fairly rapidly.

Naturally the best films are obtained when the percentage concentration in the urine is at its maximum, and a series of films taken at certain time intervals is therefore essential. It must be remembered that the films obtained depend absolutely on the ability of the glomerular system and excretory function of the kidneys to eliminate the dye, and on the concentration of the dye eliminated. If a kidney is not functioning, then no shadow of the pelvis or ureter is obtained. If there is poor functional activity, then excretion may be long delayed, or so poor that a pelvis shadow is not obtained, or is so faint that it is hardly recognizable on the films. This fact clearly indicates the conditions in which intravenous pyelography is contraindicated, namely, anuria, latent or definite uræmia, terminal Bright's disease, pregnancy with renal complications, and general systemic infections which have left the patient in a greatly weakened condition. It is advisable, therefore, to ascertain the blood urea content, and also to check the blood pressure before contemplating intravenous pyelography.

It must also be remembered that the films obtained by the intravenous method represent not only the anatomical outline of the urinary tracts, but also action and motion, both secretory and peristaltic. Here again there may be a difficulty in obtaining a satisfactory shadow for the diagnosis of anatomical or pathological conditions; for an essential part of the tract may be in systole at the time the film is taken. Rapid diuresis occurs after the injection of the dye, and it is essential that the whole calyx system, pelvis, and as much of the ureter as possible be filled with urine containing the radio-opaque substance. For this reason many advocate that the bladder should not be emptied immediately prior to the X ray examination.

Up to the present it has been impossible to obtain as sharp or as clear pyelograms as is possible with the retrograde method, simply because the intravenous method is a physiological process and not a mechanical one, and the degree of contrast depends on the concentration of the dye eliminated. When blockage of the ureter is present, however, there is frequently an increase in density out of proportion to the concentration of the dye eliminated, by reason of the urinary stasis due to the obstruction.

Applications.

These few remarks will serve to point out the general field of usefulness of intravenous pyelography; in many cases it provides all the necessary requirements in diagnosis without the necessity of recourse to the retrograde method. The simplicity, ease and safety of the technique make it an ideal method for a preliminary investigation of gross pathology. The finer anatomical points may be determined by catheterization later, if necessary.

Retrograde pyelography cannot be replaced by the intravenous method, because, when renal function is impaired, visualization by means of the latter method is impossible on the one side, or too poor on both sides, to permit of diagnosis. Provided function is good, it enables a bilateral pyelogram to be obtained. At the same time it gives a radiological estimate of the degree of functional activity of the kidneys in the time of appearance of the shadow after the injection and in the relative density of the shadows obtained. It is safe to assume that function is within normal limits if excretion of the dye occurs within, say, seven minutes after the injection of "Uroselectan *B*". If the period is longer than this, function is delayed or poor, or perhaps permanently absent on one side. This fact is useful, especially when one kidney is to be operated upon and the function of the other must be quickly demonstrated. However, absence of a shadow does not always infer permanent damage; for cases have been reported where a calculus caused so much pelvic spasm that there was insufficient dye present to cast a shadow.

Von Lichtenberg has shown that renal function can be estimated by the iodine excretion, excretion of the dye itself, and through the fixation of the dye in the blood. These points are interesting, but our ordinary methods of estimating renal function are more simple and less trying.

Advantages and Limitations.

Intravenous pyelography has been found of great service in cases where cystoscopy fails or presents

difficulties due to stricture, kink, stone *et cetera*, or where catheterization is not advisable. It is of great advantage also in the examination of elderly patients to whom instrumentation would be taxing, and in the investigation of the renal tracts of children. As an illustration of its advantages and limitations, let us consider briefly some of the points that intravenous pyelography will, or will not, show in relation to anomalies, infection, lithiasis, stasis and tumours.

Anomalies.

Horseshoe kidney may be fairly easily diagnosed without further aid than an ordinary X ray examination of the kidney region, the lower poles converging towards the spine instead of the usual divergent angle. Intravenous pyelography, however, renders the parenchyma of the kidney more opaque, and irregularities in outline, ectopic kidney, or horseshoe kidney are more easily demonstrated. Again, double plevis, fused or double ureters, which are sometimes missed in retrograde pyelography, are clearly demonstrated by the intravenous method, provided the physiological process of excretion occurs in both portions of the kidney. Demonstration of the lower third of the ureters is difficult unless some blockage exists; for in normal cases, contraction and rapid emptying of that portion occurs; also the ureters in this situation are superimposed on the shadow of the sacro-iliac region.

Infections.

In early renal infections intravenous pyelography is disappointing, since infection primarily damages the secreting parenchyma, and the resulting pyelogram is too poor for minor defects in the calyx system to be detected, unless, of course, there is associated stasis to aid intensification of the shadow. Even with the aid of associated stasis there is usually not enough definition to allow the detection of minor changes with absolute certainty. Later, when necrosis and pyelectasis have occurred, it is satisfactory, providing there is enough parenchyma uninvolved to allow a satisfactory shadow of the cavities and renal pelvis deformities to be obtained. Early ureteric changes are small and may not be demonstrated satisfactorily. The intravenous method often serves to indicate which kidney is the more affected by an infection, because of its delayed, decreased, or absent excretory activity.

Lithiasis.

Renal lithiasis, ureteric obstruction and stasis may be considered briefly together. Identification of the intrarenal, pelvic or ureteric situation of calculi is rendered more satisfactory. There may be occlusion of one calyx, due to a calculus, or a displacement of the dye or "filling defect" due to a transradiant or sparsely calcified calculus, situated in the renal pelvis. The intravenous method eliminates the sometimes confusing accident of the injection of an air bubble during the retrograde method, which may simulate a "filling defect" or transradiant calculus. Small calculi, however, are often difficult to demonstrate owing to the lack of detail obtained by the intravenous method.

Stone in the ureter is usually well demonstrated, there being delay in appearance of the shadow on the affected side, with ureterectasis and pyelectasis, and greater contrasts due to the stasis caused by the obstruction. A similar apearance is shown with ureteral stricture.

Stasis.

Bilateral hydronephrosis also gives a striking picture. There is delay in the appearance of the shadows of the enlarged pelves and ureters, and the later pictures show greater contrast than earlier ones; this is exactly opposite to the normal findings. In fact, the most striking demonstrations are obtained in conditions in which a degree of urinary stasis exists.

Tumours.

Renal neoplasms often cause destruction of the whole kidney and, of course, completely prevent the excretion of dye. In such cases retrograde pyelography must be resorted to for diagnostic information. In children, however, if there is a palpable tumour on one side, intravenous pyelography will suffice to demonstrate the presence of a normal pyelogram on the opposite side, with absence of function on the affected side.

Early malignant involvement of the renal pelvis cannot be demonstrated because of the lack of clarity essential for demonstrating small defects. An advanced case of papilloma of the renal pelvis might be recognized, but it is far more satisfactory in suspected neoplastic conditions to use the retrograde method at once. It is difficult to distinguish deformities of the calyx system and renal pelvis from those caused by extrinsic pressure, from cystic conditions and so forth.

Technical Points.

Important points, too, which must be taken into consideration in the interpretation of intravenous pyelograms, are technical ones. Instances of these are the "pseudo-kink" of the ureter that appears when the skiagraph is taken in deep inspiration, and also whether abdominal compression is used or not. Obesity and the preparation of the patient have a distinct influence on the relative contrast of the pyelographic shadows. Another point which has an influence on the technical result, is for the patient to have a moderately filled bladder prior to and during the radiographic examination. The bladder is gradually filled with urine containing the contrast substance as excretion progresses, and a complete bilateral pyelogram and a cystogram may thus be obtained. A moderately filled bladder tends to prevent the rapid emptying of the ureters when increased diuresis of urine containing contrast substance begins after the injection.

Summary.

I have tried to point out in this brief summary the various fields of application of intravenous

pyelography and at the same time to show wherein lie the limitations of this method.

It will be evident that it is a valuable addition to the armamentarium for the diagnosis of urinary tract conditions, in that it sometimes permits a diagnosis without instrumentation and is of great advantage when ureteric catheterization is contra-indicated or impossible. For this reason it is indicated prior to instrumentation, but it can never take the place of the retrograde method, since its greatest disadvantages lie in the fact that minor changes in the pelvic and ureteric outline cannot be demonstrated, and also that its success is dependent on physiological processes. Conditions in which a degree of urinary stasis exists are the ones which give the most striking and clear intravenous pyelograms.

SOME OBSERVATIONS ON THE PROGNOSIS IN ACUTE NEPHRITIS.

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Preliminary Considerations.

ACCURATE statistics of the immediate and late prognosis in acute nephritis are rarely found in the literature, except in the case of war nephritis. The large body of data, often somewhat contradictory, in connexion with war nephritis contrasts with the relative silence as to acute nephritis in civilians. Perhaps this may be explained by the relative rarity of acute nephritis in civil practice so far as this country is concerned. Apart from the large number of cases reported from Queensland[1][2] and associated with the use of paint containing lead, acute nephritis does not seem to be very common in Australian practice. Between July 1, 1919, and June 30, 1930, ninety cases only of acute nephritis have been admitted to the Alfred Hospital.

Before looking to war nephritis to provide a prognostic criterion for civilian acute nephritis, the interrelation of the two diseases may be briefly discussed. It is the opinion of many writers that war nephritis was a distinct disease, perhaps milder than civilian acute nephritis. Its initial mildness may have depended upon the splendid physical health of the soldiers attacked. Its characteristic symptom of dyspnœa was attributed by Maclean[3] to the strenuous conditions of life in the front areas, and this writer admits no essential difference between war and civilian nephritis.

The prognosis in acute war nephritis may be summed up as in Table I, compiled by the German worker Gros[4] from various sources.

It will be seen that, even though war nephritis be initially a mild disease, its eventual prognosis is grave.

Compared with these statistics, those for civilian acute nephritis are disappointingly vague. Brown and Evans[5] merely state that the longer the duration of the acute stage, the less favourable is the prospect of eventual recovery; also that disappearance of albumin from the urine within a month of the onset of the disease is a hopeful prognostic sign. Like all other writers, they emphasize the fact that albuminuria alone is not of prognostic import unless taken with tests of renal function. Tidy[6] states that the development of chronic nephritis is usual if albuminuria persist for longer than a month after the onset of the disease, and that persistence for three months is a grave prognostic sign. He does not regard convulsions at the onset of the nephritis as of serious import in children.

Fordyce[7] believes that the prognosis is less favourable in the very young than it is in older children. In scarlatinal cases he states that the immediate mortality is about 5% and that the tendency to ultimate recovery of renal function is high among those who survive the initial attack. Non-scarlatinal nephritis, according to this author, has a mortality rate of about 20% in the acute stage and a greater tendency towards persistent albuminuria than the scarlatinal cases.

Pearson and Wyllie[8] state that death is very rare in the acute stage of "hæmorrhagic" nephritis (that is, acute nephritis with constitutional disturbance, gross hæmaturia, trivial œdema, low blood pressure and absence of nitrogen retention) and that complete, though possibly delayed, recovery is the rule. Acute "œdematous" nephritis (that is, nephritis associated with marked œdema and oliguria, profuse albuminuria, slight hæmaturia, numerous casts in the urine, and retention of nitro-

TABLE I.
The Results of War Nephritis according to Several Observers.

Author.	Number of Cases.	Complete Recovery.	Residual Albuminuria Without Signs of Nephritis.	Chronic Nephritis.	"Contracted Kidney" (with Retinal and Vascular Degeneration).	Died.
Hume and Nattrass	281	45·5%		45·0%	9·5%	2·5%
Dyke	100	70·0%	—	—	—	3·0%
Thornton	100				10·0%	
Siguret	47	6·4%	10·6%	46·8%	31·9%	4·3%
Shirokauer	26	84·6%	—	—	—	7·6%
Deutsch	26	49·5%	21·5%		29·0%	
Goldscheider				10·0%		
Gerhardt	100	58·0%	42·0%	—	—	—
Gros	211	44·6%	21·7%	24·7%	9·0%	5·2%

genous wastes), on the other hand, may be associated with immediate fatality or may progress to chronic nephritis.

In view of the indefinite character of the literature in regard to civilian acute nephritis, the present writers are led to report a small series of cases. They have attempted to estimate the immediate prognosis by consideration of the records of ninety patients admitted to the Alfred Hospital in the period 1919 to 1930. As indicating the late prognosis, they will present data obtained by tracing and reexamining forty-eight of those ninety patients. The series of cases is admittedly small, and the work has been handicapped by the inadequate nature of the hospital records and by the negligence of the patients in reporting for thorough reexamination. The data are, however, presented in the hope that they may elicit further publications by other workers, allowing a more complete review to be made of the prognosis of acute nephritis in Australia.

Incidence of Acute Nephritis During the Period 1919-1930.

The age incidence of acute nephritis in ninety cases is shown in Table II.

TABLE II.

The Age Incidence in Acute Nephritis.

Age in Years.	Number of Cases.	Percentage of 90 Cases.
Under 10	33	36·7
11–20	29	32·2
21–30	10	11·1
31–40	11	12·2
41–50	3	3·3
51–60	3	3·3
61–70	1	1·1

It will be seen that the greatest incidence is in the first decade of life and that the first two decades combined account for 69% of the total.

Immediate Mortality.

The immediate mortality is 5·5%, that is five deaths in ninety cases. The mortality was highest in the later age groups, although these included the minority of the cases. The position is set out in Table III.

TABLE III.

The Immediate Mortality in 90 Cases of Acute Nephritis.

Decade of Life.	Number of Cases.	Deaths.
First	33	0
Second	29	1
Third	10	2
Fourth	11	1
Fifth	3	0
Sixth	3	1
Seventh	1	0
Total	90	5 (5·5%)

Actually, in 62 cases occurring in the first two decades of life, the mortality was 1·6%. In 28 cases occurring later than the second decade, the mortality was 14·3%.

Manner of Death in Acute Stage.

Of the five patients who succumbed, one died as a result of miliary abscesses in lungs and kidneys, presumably part of a septicæmic process. The acute focal nephritis was apparently only an intercurrent event.

The cause of death of the other four patients was uræmic coma. In three of these cases the clinical notes are too imperfect to provide valuable data. The fourth patient, aged fifteen years, fits neither the "hæmorrhagic" nor "œdematous" classification, presenting signs of both types. The urine was loaded with blood, casts were present, œdema was severe and generalized, the blood urea content was 77 milligrammes per 100 cubic centimetres of blood, and the urea concentration in the second hour was 0·9%. After an illness of four weeks, in which gallop rhythm of the heart developed, the blood urea content rose to 118 and finally to more than 250 milligrammes per 100 cubic centimetres before death in coma. This case exemplifies certain difficulties in the classification of the nephritides, to which further reference will be made.

It is interesting to note that of the ninety patients, thirteen (14·4%) showed uræmic manifestations, and four died. Of thirty-three patients in the first decade of life, two suffered from uræmia, but none died. There were twenty-nine patients in the second decade of life; six suffered from uræmia and one died. Among twenty-eight patients older than the second decade, there were five cases of uræmia and three deaths. In our series, then, the incidence and severity of uræmia were greater in the later age groups.

The diagnosis of uræmia was made on the incidence of coma or convulsions, with increased nitrogen retention. A raised blood urea content, without further evidence of uræmia, was much more common than was expected. In fourteen cases where the blood urea content of children below the age of ten years was estimated, it was found to exceed a value of 30 milligrammes per 100 cubic centimetres in eleven instances. In thirty-four patients above the age of ten years the blood urea content exceeded 45 milligrammes per 100 cubic centimetres in twenty instances.

Condition on Discharge from Hospital.

Patients were kept in hospital until free of symptoms and of œdema, that is, for a period of from two to twenty-two weeks. The average period was approximately five weeks in all age groups, but bore a very slight relationship to the severity of the initial symptoms. At the time of leaving hospital, 42% of the children under ten years of age and 46% of patients under twenty years of age had albuminuria. Of the patients over twenty years of age, 65% had albuminuria. It is possible that the persistence of albuminuria for longer than four weeks after the onset of symptoms is not the unfavourable sign which many writers regard it.

Of five patients in the above series who have progressed to chronic nephritis, four certainly passed albumin for more than four weeks after the initial attack. On the other hand, of thirty-one patients examined by us several years after the initial attack and found to be healthy, no less than seventeen had passed albumin for more than four weeks after the initial acute nephritis. We are of opinion that albuminuria may persist for several months after the acute attack without precluding eventual and complete recovery; but we are unable to state how long this period may be.

The amount of albumin in the urine in both acute and chronic nephritis seems to be very inconstant, and fatal uræmic coma has been observed without any albuminuria. Maclean has suggested that the amount of albumin in the urine is inconstant, owing to fluctuations in the volume of water secreted by the kidneys. In the above series of ninety patients albumin, as determined by the acetic acid and boiling test, was absent from the urine of three patients who presented the clinical picture of acute nephritis. Of these, one was passing casts and two both blood and casts.

Ætiological Factors.

It rarely was possible to assign any definite ætiological factor in our series of ninety cases. No case occurred in association with scarlet fever, since scarlet fever patients are not accepted in a general hospital. Infected tonsils were present in seventeen cases, or 19% of the whole; but it is impossible to determine how often the tonsillitis was a determining factor and how often coincidental. Four cases followed *otitis media*. Exposure, pneumonia and pregnancy were associated each with one case. One patient had suffered from diphtheria three months before and still yielded a positive culture of Klebs-Löffler bacilli from the throat. Syphilis was present in one case. Two patients were newly convalescent from measles. One patient developed nephritis after having taken approximately seven mils (two fluid drachms) of spirit of juniper daily for three successive days, in an attempt to relieve the pain of sciatica.

Complications.

Of the ninety cases, pneumonia was present in three (3·3%) and pleurisy in one (1·1%). Basal congestion of the lungs was frequent, being present in thirteen cases (14·4%). Cardiac decompensation occurred in two cases (2·2%). None of these complications was fatal.

Late Results.

It proved possible to trace and reexamine forty-eight of the ninety patients, a fair proportion when the migratory character of the hospital population is considered.

The reexamination consisted in thorough clinical examination, with special reference to the circulatory system. The blood pressure was ascertained and the ocular fundi examined. The urine was examined for the presence of blood, albumin and casts. The powers of urea concentration and blood urea content were estimated by one of us (I.M.McP.) by the methods of Maclean.[3] The examination was not always complete, owing to apathy on the part of the patients; but evidence in each case was always sufficient to classify the patient as suffering from chronic renal disease or not.

The average time between initial attack and reexamination was $4\frac{3}{5}$ years in patients aged less than ten years at the time of the acute illness, $4\frac{1}{2}$ years in patients aged from eleven to twenty years at that time, and $7\frac{1}{5}$ years in older patients. The results of the reexamination may be well taken with the initial mortality in the acute attack, as shown in Table IV.

It will be seen that nephritis contracted in the first decade of life carried the least immediate risk and the least danger of subsequent sclerotic changes in the kidneys. The results in the second decade were graver, there being one death in twenty-nine acute cases, and three of the fifteen survivors traced being found to have chronic nephritis. In older patients the severity of the disease seemed to be even greater. Of twenty-eight such patients, four died in the acute stage, and of thirteen survivors reexamined, four had progressed to chronic nephritis.

Taking the forty-eight patients reexamined, it will be seen that seven (14·6%) contracted chronic nephritis. This would at first sight indicate a much more favourable prognosis for acute nephritis in civilians than for war nephritis as shown by Gros's table above. If, however, we take the civilian patients of military age (twenty-one to fifty years), we find that of twenty-four such patients in our series, three died in the acute attack. Of the twenty-

TABLE IV.

The Late Results of Acute Nephritis in a Series of 90 Cases.

Age in Years.	Cases.	Died.	Survived.	Survivors Traced.	Died from Chronic Nephritis.	Alive, but with Chronic Nephritis.	Alive and Healthy.
Under 10	33	0	33	20	0	0	20
11–20	29	1	28	15	1	2	12
21–30	10	2	8	5	0	1	4
31–40	11	1	10	5	1	1	3
41–50	3	0	3	2	0	0	2
51–60	3	1	2	1	0	1	0
61–70	1	0	1	0	0	0	0
Totals	90	5	85	48	2	5	41

ILLUSTRATIONS TO THE ARTICLE BY DR. R. GRAHAM BROWN AND DR. J. V. DUHIG.

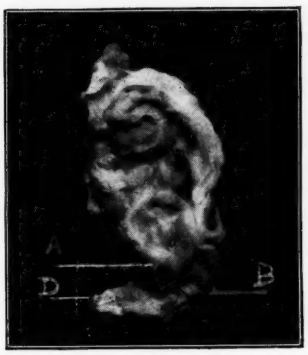

FIGURE IA.

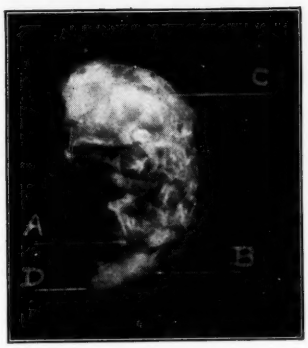

FIGURE IB.

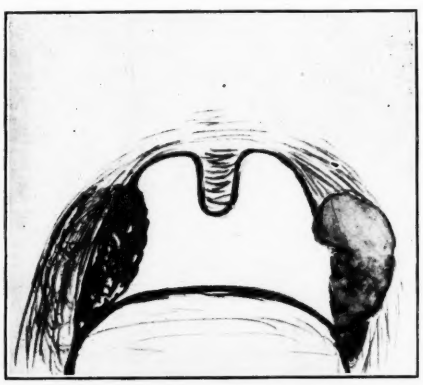

FIGURE IC.

FIGURE III.

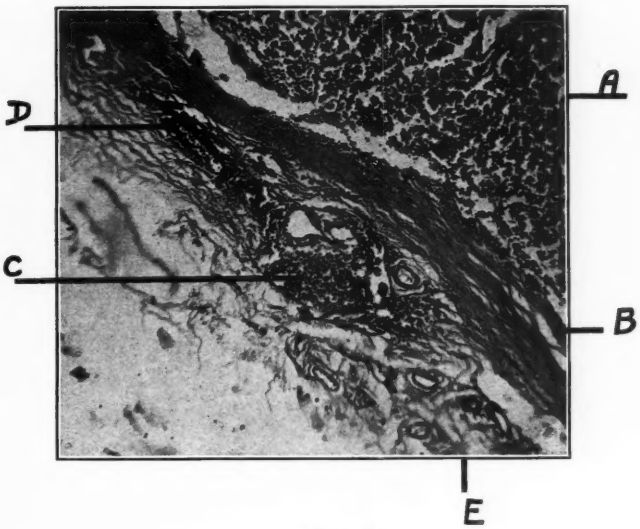

FIGURE II.

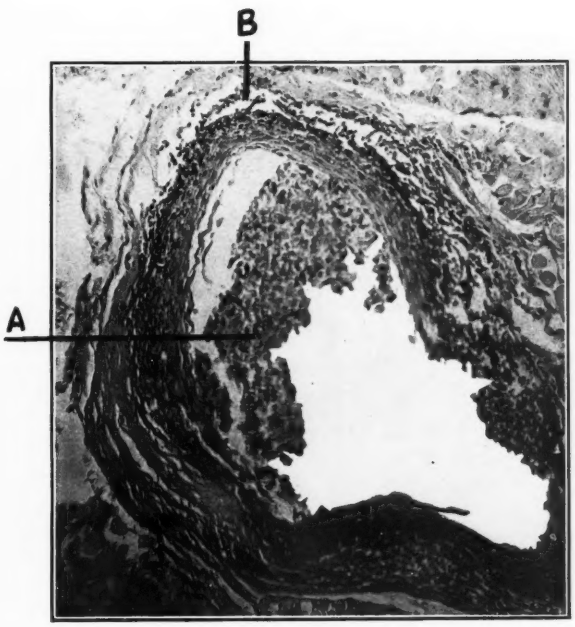

FIGURE IV.

ILLUSTRATIONS TO THE ARTICLE BY DR. R. GRAHAM BROWN AND DR. J. V. DUHIG.

FIGURE V.

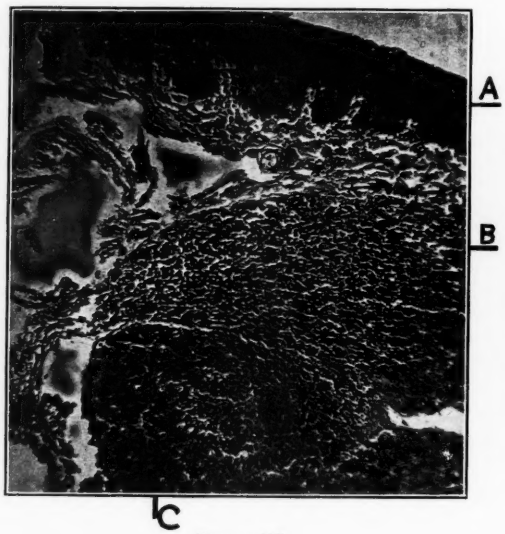

FIGURE VI.

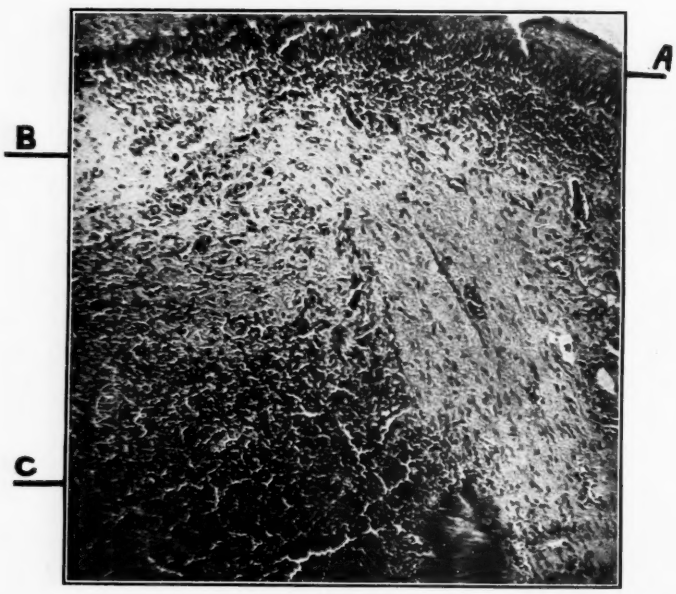

FIGURE VII.

FIGURE VIII.

ILLUSTRATIONS TO THE ARTICLE BY DR. R. GRAHAM BROWN AND DR. J. V. DUHIG.

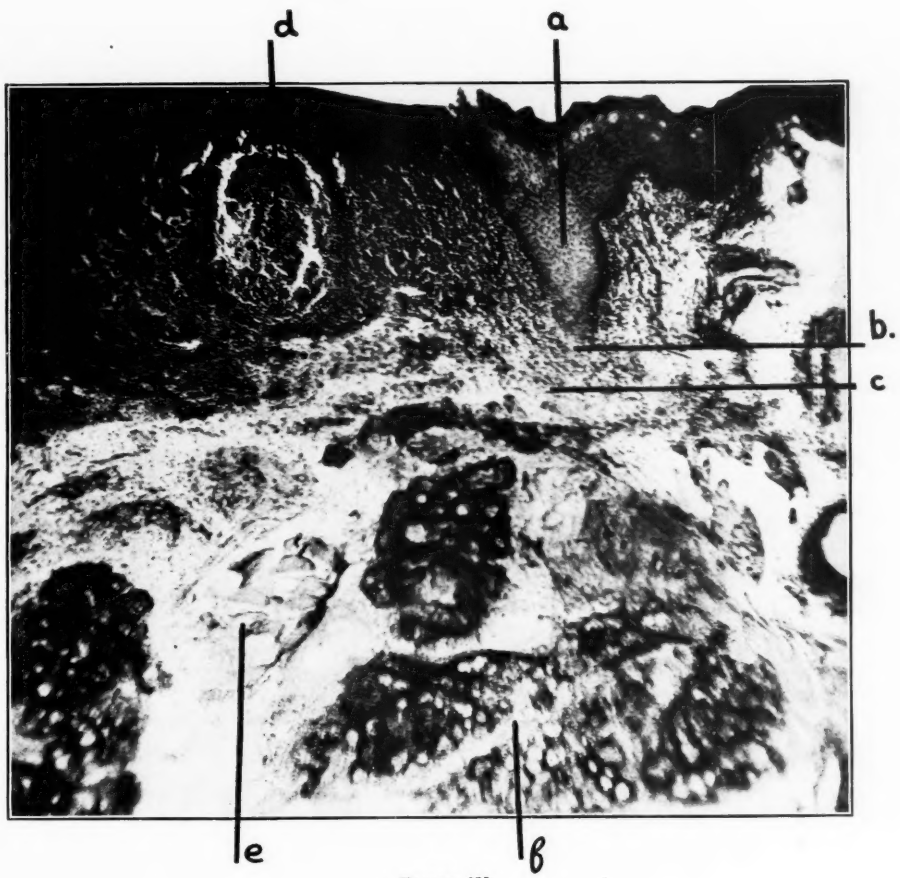

FIGURE IX.

ILLUSTRATIONS TO THE ARTICLE BY DR. ALAN E. LEE AND DR. L. J. JARVIS NYE.

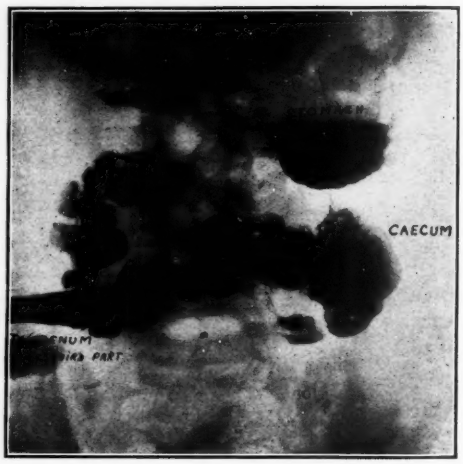

FIGURE I.
Skiagram showing six-hour motor meal, with barium residue in stomach, first part and third part of duodenum.

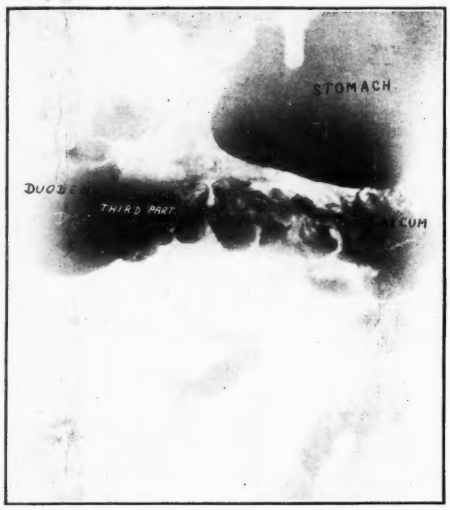

FIGURE II.
Patient erect, three minutes after barium meal, *plus* six-hour motor meal.

FIGURE III.
Patient supine, ten minutes after barium meal. Note dilated second part of duodenum.

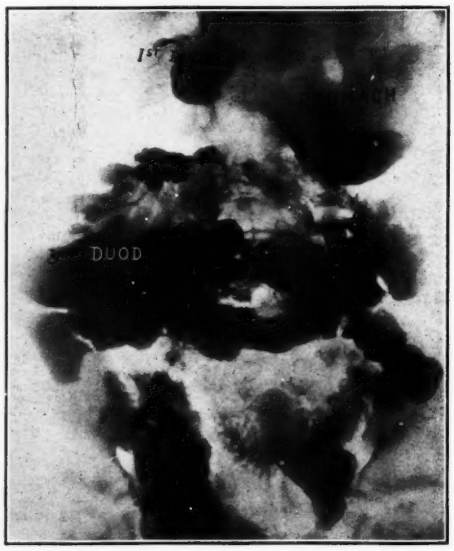

FIGURE IV.
Patient erect, two hours after barium meal.

one survivors, twelve were traced. Of these, one had did of chronic nephritis and two presented evidence of renal sclerosis. Whilst the number of cases is far too small to permit of dogmatism, it seems possible that the late results of acute nephritis in civilian patients of this age group may not differ very greatly from those following war nephritis.

The two patients known to have died from subsequent chronic nephritis were aged forty-three and eighteen years respectively at the time of the acute attack. They died three and one-third and four years later, respectively. The former patient suffered from the "acute œdematous" type of nephritis, with marked œdema and many casts in the urine, but no hæmaturia. Decapsulation of the kidneys was performed three years later. In the final stages, though œdema was extensive, the syndrome of nitrogen retention was now apparent. The blood urea content was 207 milligrammes per 100 cubic centimetres, the urea concentration was 0·65% in the second hour, and retinal arteriosclerosis was present. Death occurred in uræmic coma. The second patient presented a "mixed" type of nephritis, with slight œdema, much hæmaturia, many casts in the urine and marked retention of nitrogenous waste. She progressed to vascular sclerosis, albuminuric retinitis and eventual uræmia.

The progression of acute nephritis to "chronic hydræmic" nephritis has occurred but three times in our series. Once was in the fatal case mentioned immediately above, and even here the final picture was of nitrogen retention and uræmia. Another patient was reported as having suffered from a return of œdema seven months after his acute attack; blood analyses were not recorded, and the patient cannot now be traced. A third patient presented a mixed picture of œdema and nitrogen retention sixteen months after the acute attack. Otherwise, of three other patients who have progressed to chronic nephritis, the picture is not one of hydræmia. Two show renal sclerosis, with presence of albumin and casts in the urine; the blood urea content is at the upper limit of normality and the powers of urea concentration are deficient. The third patient, an elderly man, has albuminuria without casts, a "high normal" blood urea content, and a moderately efficient urea concentration; his renal lesion may be degenerative rather than sclerotic.

We may sum up the late results in our small series of cases by stating that the immediate and remote prognosis seems to have been very good in patients under the age of ten years. In the second decade the prognosis, though not immediately very grave, was more serious as regards late results. In the older patients the immediate and remote prognosis was much more serious. All the deaths in the acute stage were due to uræmia, whilst those at later periods were also uræmic eventually.

Difficulties in Classification of the Nephritides.

It is pointed out by Maclean that classifications of the nephritides based on the morbid anatomy of the kidney *post mortem* are not helpful to the clinician, who requires to know rather how the kidney behaves during life than how it will appear after death. Various classifications have accordingly been put forward in attempts to group the nephritides in terms of the altered physiology of the kidney in disease. These classifications, however helpful for purposes of teaching, are apt to fail when applied to actual clinical problems.

It is found that a certain number of cases will conform to any given classification; the majority, however, can be rarely grouped as altogether "azotæmic" or "hydræmic", altogether "hæmorrhagic" or "œdematous". These terms could be applied to our series of patients only in the broadest sense. Azotæmia was, for example, a far more common incident in acute nephritis than we had anticipated. The presence and degree of œdema seemed to bear little relation to the presence or absence of blood or casts in the urine, or to the efficiency of nitrogen elimination. In general, "mixed" types seemed rather the rule than the exception.

Summary.

1. Statistics of ninety cases of acute non-scarlatinal nephritis are presented. The highest incidence and least immediate mortality were in the first decade of life. The incidence was almost the same in the second decade of life; the mortality was slightly greater. Cases were less frequent in the later decades, but the mortality was much greater.

2. Uræmic symptoms were present in 14·4% of the acute cases, and death (when it occurred) was uræmic in nature. Uræmia was more fatal in patients older than the second decade of life. Evidence of nitrogen retention was found more often than was expected, even when œdema was present and no uræmic manifestations occurred.

3. Approximately half of the patients had albuminuria more than four weeks after the commencement of the acute attack. The value of persistent albuminuria as a prognostic sign is discussed.

4. No frequent ætiological factor could be assigned. Tonsillitis, possibly coincidental, was present in 19% of the patients.

5. Apart from uræmia, basal congestion of the lungs was the commonest complication. Pleurisy, pneumonia and cardiac decompensation were also recorded. No patient died as a result of these complications.

6. It is possible to trace the after-history of forty-eight of the ninety patients, of whom two have died from chronic nephritis and five are still alive, though suffering from it. No patient aged less than ten years at the time of the acute attack has progressed to chronic nephritis. Of fifteen patients reexamined, who had suffered from acute nephritis in the second decade, one is dead and two have chronic renal damage. Of thirteen patients reexamined, whose acute nephritis occurred subsequent to the second decade of life, one is dead and three suffer from

chronic nephritis. A comparison is made between the late results of acute nephritis in civil life and of war nephritis.

7. The difficulties of classification of the nephritides are discussed in view of the fact that the majority of the ninety cases above seem to have been of "mixed" type assignable to no rigid classification.

8. It is unlikely that any one writer will possess sufficient material for a complete survey of the prognosis in acute nephritis in civilian practice. The present paper, whilst admittedly based on a limited series of cases, is put forward in the hope of eliciting publications by other workers. If each metropolitan hospital in Australia were to report similarly, it would not be difficult for one subsequent worker, by combining the data, to arrive at the truth.

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(8) W. J. Pearson and W. G. Wyllie: "Recent Advances in Diseases of Children", 1928, page 489.

Reports of Cases.

CHRONIC DUODENAL OBSTRUCTION DUE TO NON-ROTATION OF THE MID-GUT LOOP, WITH SUPERADDED VOLVULUS.

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THE essential rareness of the type of case here recorded, together with the fortunate outcome of surgical intervention and the light which such anomalies of intestinal rotation throw on the normal processes of embryological development, have prompted us to record the following case history.

Clinical History.

An eleven year old boy was brought to one of us with the following history:

Since early infancy he had suffered from recurring vomiting attacks. When he was very young they occurred every two to three weeks, but latterly about every month. The course of a typical attack would be as follows. Pain would occur first, commonly felt in the left hypochondrium, from which it would quickly work across the upper part of the abdomen, where it would become colicky, causing the boy to assume a lateral decubitus with his knees drawn up to his chin. Nausea and profuse vomiting would follow, with temporary relief of the pain; but recurring bouts of distress would continue for four to seven days before the attack finally settled.

During the attacks his mother said that lumps would form in the upper part of the abdomen as though a blockage were present. After an attack he would be very hungry and would remain quite well till a further attack developed. It had been clearly noticed that certain articles of food might precipitate an attack, and eating an apple was especially established in this regard. He was not usually constipated, and the state of the bowels seemed to bear no relation to the incidence of attacks.

The boy's condition had been investigated on several occasions and treatment based on a provisional diagnosis of cyclical vomiting with acidosis had been instituted, but had not been successful in reducing the number or severity of the attacks.

Physical examination revealed a frail, thin, highly intelligent child. The abdomen at this time (between attacks) was quite flat, and no abnormalities could be detected either here or in other parts of the body.

A fractional test meal revealed 95 cubic centimetres of resting juice, together with twelve-hour charcoal residue, but was otherwise within normal limits in every respect.

He was examined radiologically after a barium meal, with the following findings (see Figures I to IV). There was considerable six-hour barium gastric residue, with much secretion above; there was residue in the first part of the duodenum and also in the third part. The stomach was large, J-shaped, hypotonic, with no pathological abnormalities.

The first part of the duodenum was normal. The meal then passed down and to the right through a greatly dilated second part into a reservoir in the third part. From here the meal could not be followed, but it appeared later in the upper jejunum. In (or underlying) one of the jejunal loops a hard cartilaginous-like swelling could be felt in a position approximately 3·75 centimetres (one and a half inches) to the left of the umbilicus. The caecum appeared to be in a position to the left of and above the umbilicus, and from here the colon passed to the right towards the dilated duodenum.

The radiological diagnosis was chronic duodenal obstruction associated with mal-rotation of mid-gut loop.

On the basis of these findings operative intervention was advised and accepted.

Under open ether anæsthesia the abdominal cavity was explored through a left paramedian upper abdominal incision. The following conditions were disclosed. The dilated stomach and duodenum were as shown in the radiological examination. At the point where the pool of barium was present, the duodenum passed behind a mesentery which proved to be that of the penultimate loop of ileum, and merged beneath into jejunum of normal size. There was a complete absence of fixation of the mesentery of the small gut to the posterior abdominal wall, so that the intestines could be picked up *en masse* and lifted outside the abdominal incision.

The penultimate loop of ileum passed across the duodenum from left to right, and the ultimate loop then passed behind the mesentery of the small gut to terminate in the caecum, which lay to the left of the middle line in the upper part of the abdomen. The ascending colon passed to the right and then turned upwards alongside (and to the left of) the duodenum, to join a normal transverse colon. Thence distally the hind gut occupied its normal site.

The blood supply of the terminal loops of ileum and of the caecum included enormous veins which ran in the mesentery parallel to and about 2·5 centimetres (one inch) from the gut. These veins thus made a complete ring around the duodenum at the site of obstruction.

The hard cartilaginous mass noted in the radiological examination was situated near the base of the small gut mesentery, and was either a mass of enlarged glands or dilated lymphatics.

At the point where the duodenum passed behind the ileal mesentery, there was a large aperture 7·5 centimetres (three inches) in diameter, closed with a thin avascular membrane. Nothing capable of producing a mechanical block seemed to be present here.

In considering how to undo the condition of affairs present, it at first seemed that if the small gut was threaded back through the aperture, the obstruction would be relieved. On doing this, however, it was found that the mesentery was now twisted in the region of the opening. The gut was therefore replaced and a lateral duodeno-

jejunostomy performed anterior to the penultimate ileal loop. Two rows of catgut sutures posteriorly and three rows anteriorly were used for the anastomosis.

This procedure certainly relieved any mechanical duodenal obstruction, but it seemed now that this anterior anastomosis, together with the position of the terminal ileal loop, might possibly cause a blockage at that end of the gut. A lateral anastomosis was therefore made between the left end of the penultimate ileal loop and the caecum (these portions of the gut naturally lying against one another). The intestines were sponged clean and the parietal incision closed in layers.

The boy made an uninterrupted recovery and was discharged from hospital on the sixteenth day after operation. In the intervening twelve months he has remained perfectly well, has put on nearly a stone in weight, and altogether looks a new child. He states: "My abdomen now feels quite different to what it did previously." This result was all the more gratifying when the obvious venous and lymphatic block in the mesentery is considered.

Although the dilated duodenum stopped abruptly at the ileal mesentery, the size of the aperture here seemed to render a mechanical block most unlikely, and a neurogenic obstruction of the kind said to occur in the third part of the duodenum in some cases of visceroptosis seemed more probable.

A study of the literature bearing on abdominal disorders due to embryological defects was of very little help as regards prognosis. These cases are very rare, only a small number having been recorded; and, moreover, with few exceptions they were found in new-born babies. Even in the patients who were treated in adult life, the operation seemed to be rarely survived, and the ultimate result was scarcely ever stated.

Discussion.

The abnormalities existing in this boy's abdomen were confined to that portion of the intestinal tract extending from the duodenal papilla to the middle of the transverse colon, which is supplied by the superior mesenteric artery and described by embryologists as the mid-gut loop.

The complex series of changes by which a simple midline tube, slung from the posterior abdominal wall by a dorsal mesentery, develops into a structure occupying a more or less fixed position in widely separated parts of the abdominal cavity, can be briefly described as stages in the rotation of the mid-gut loop.

The mechanism of this rotation has been studied, and its comprehension teaches us not only the reason for the normal position of the intestine, but also makes clear what derangement of the mechanism must have occurred to account for abnormalities such as the one under discussion.

In brief, the stages of normal intestinal rotation are as follows. During the fifth week of intrauterine life the mid-gut is elongating rapidly and forms a large loop, convex forwards. The liver is also growing rapidly in size, and the available intraabdominal space is becoming so encroached on that the apex of the mid-gut loop is forced into the root of the umbilical cord, forming, as it were, a physiological hernia.

At the apex of the loop is the site of the former vitelline duct, and from this point the superior mesenteric artery stretches back to its insertion in the dorsal aorta, between the closely approximated ends of the loop, the so-called duodeno-colic isthmus.

The loop lies at first in the sagittal plane, but as growth proceeds, secondary flexures develop, forming an S-shaped bend, the pre-arterial segment of which has its convexity to the right and the post-arterial to the left. The caeco-appendix appears as a bud from the post-arterial segment, and grows rapidly in bulk. Reduction of the physiological hernia into the abdomen usually occurs about the tenth week, but by this time its size is so great that return *en masse* is not possible.

Under normal conditions return in sequence therefore occurs, the pre-arterial segment first, basal end foremost. As the pre-arterial coils re-enter the abdomen they pass beneath the outstretched superior mesenteric artery, pushing the hind gut before them as they do so.

The caecum and the termination of the artery return last, and their primary intraabdominal position is therefore close beneath the umbilicus and anterior to the rest of the small gut. As growth proceeds, the proximal colon behaves just as does a coiled-up rubber tube on inflation, that is, it tends to straighten out; and in this endeavour the caecum passes first upwards and to the right, and then downwards along the under-surface of the liver and the lateral abdominal wall to the right iliac fossa.

Later, certain secondary fusions of mesentery and parietal peritoneum occur, and these positions are thus maintained.

Suppose now that reduction of this mid-gut umbilical hernia occurred at an earlier stage, while return *en masse* was still possible. The first stage of rotation will have occurred, that is, the development of the secondary loops, with the pre-arterial segment convex to the right and the post-arterial segment to the left. After reduction the mid-gut will take up a similar position in the abdomen to that it occupied in the cord. From the proximal end of the loop the jejunum will pass downwards on the right side of the abdomen; the ileum will lie, generally speaking, below and to the left of the jejunum, and the caecum will lie to the left and be joined by a short ascending colon to the transverse colon, the portion of which forming the base of the mid-gut loop is lying close below and to the left of the duodenum.

If now, with the mesentery between the duodenum and caecum as base, a twist of the small gut 90° in a clockwise direction occurs, the terminal part of the ileum will pass beneath the small gut mesentery.

A further twist of 90° in the same direction will bring the penultimate ileal loop across in front of the duodenum. Let a certain amount of adhesion of these crossed loops occur and we have the exact position found in this boy.

We may say, then, that from the embryological point of view this boy's abnormality consisted in a non-rotation of the mid-gut loop, with a secondary volvulus of the small intestine 180° in a clockwise direction.

Summary.

1. A case of chronic duodenal obstruction due to an anomaly of intestinal rotation is described.
2. The steps of a successful operative treatment of the condition are detailed.
3. The embryology of the condition is discussed.

Reviews.

EMERGENCY SURGERY.

THE fifth edition of "Emergency Surgery" aims to provide a volume of ready reference for the general practitioner as a "guide out of uncertainty in times of stress".[1] The authors contend that by force of circumstances they are in a position to know the needs of the practitioner. In the light of their knowledge they have endeavoured to meet these needs.

The volume commences with a concise description of the duties and equipment of the practitioner in the rôle of emergency surgeon. A short description of post-operative treatment is given.

Brief chapters on anæsthesia, suture methods and materials, dressing and bandaging, and the use of various fracture appliances follow, each being dealt with in clear language assisted by well chosen illustrations.

Gunshot wounds in civil and in military practice are dealt with in separate chapters, and their accompanying hæmorrhage and shock are described in the orthodox manner.

As is expected in a work of this kind, a very large proportion of the volume is devoted to fractures. The

[1] "Emergency Surgery", by J. W. Sluss, A.M., M.D., F.A.C.S., and J. W. Martin, M.D., F.A.C.S., assisted by D. H. Sluss and C. B. De Motte; Fifth Edition; 1931. Philadelphia: P. Blakiston's Son and Company. Demy 8vo., pp. 894, with 797 illustrations, some in colour. Price: $5.00 net.

descriptions of mechanism, X ray appearances and methods of reduction and treatment, are profusely illustrated, and make this the outstanding portion of the volume. The authors advise conservative treatment wherever possible, even in the most complicated fractures, and declare that the reward in a large percentage of cases is a useful limb which would have been sacrificed by the adoption of more drastic original treatment. The chapter on injuries to joints is disappointing in its brevity, and is not of the same standard as those dealing with fractures. Excellent chapters on abscesses, infections of the hand and arm, suppurative arthritis and osteomyelitis follow, all the treatment described being in accord with modern practice.

The chapter on foreign bodies is fairly comprehensive; but the authors should realize that the bronchoscope is not found in the armamentarium of the general practitioner, and the probang and coin-catcher are tools which can be avoided in most cases.

A very practical and useful chapter is devoted to the commoner amputations. It is followed by a well illustrated description of the commoner ligations of blood vessels. The fact that some of those described are no longer of use other than as dissecting room exercises detracts somewhat from the value of this chapter.

Injuries to tendons and nerves are next dealt with, the procedure in emergency cases being well described. But it must be pointed out that the late repair of damaged or divided nerves is generally outside the scope of the general practitioner; neither can it truly be termed "emergency surgery".

The various operative procedures to be adopted in emergency conditions in the cranium, chest and abdomen, are described at length and in a thorough manner, with the assistance of good illustrations. A short and useful chapter is devoted to Cæsarean section.

One of the outstanding portions of the book is that describing rupture of the urethra and extravasation of urine, subjects which are often given insufficient prominence in works of this kind.

The book concludes with short chapters on skin grafting, ingrowing toenail and the removal of small tumours.

It is unfortunate that the last page should contain the worst error. "Branchial cysts are often intimately connected with the vessels in the neck, and their dissection may be extremely difficult. The pedicle of such cysts usually terminates in the thyro-glossal duct." It has not been our misfortune to meet with such an interesting embryological abnormality.

The book is well printed on fairly good paper, and is very well bound. It is, as the authors claim, a book suitable for the use of students and general practitioners. The surgical specialist is not likely to derive much profit from a perusal of its pages.

RADIOTHERAPY.

DR. A. CAMERON MACLEOD has put on record in a small book a series of cases in which radium was employed therapeutically at the Middlesex Hospital.[1] The work is really a photographic record showing the condition before, during and after treatment, and in some cases the position of the radium needles. The photographs, of which there are 122, are excellent reproductions, one on each page, with a printed summary of the case beneath, setting out treatment and the dose employed. Failures are shown as well as successes.

After a review of the history and technique employed at the Middlesex Hospital, there follow chapters on three main groups: "Carcinomata", "Sarcomata" and "Miscellaneous". The first of these includes cases of squamous-celled carcinomata of the lip, tongue, maxilla and penis; then basal-celled cancers or rodent ulcers, and, lastly, spheroidal-celled cancers of the breast and parotid gland. The cases of sarcomata are of the clavicle, superior maxilla and mandible. *Lupus vulgaris* and lupous carcinoma and odontome of the lower jaw are dealt with in the last chapter.

This work shows that the method of employing a very large quantity of radium over a short period has apparently been replaced by the employment of a smaller quantity over a longer period. In fact, the old tubes containing larger quantities of radium were remade into needles containing much smaller quantities; and it is now the practice to screen the radon seeds by Muir's technique of placing them into platinum cases of 0·3 millimetre thickness.

The author points out that "the time has not yet come for determining the value of radiation treatment by statistical methods. That this value is great there can be no doubt. It is believed that this collection of photographs will convince those who are sceptical, at the same time illustrating the limitations of radiotherapy".

There are 154 pages, all of which should prove to be most useful to those reviewing cases for treatment by radium at cancer clinics.

ACUTE MIDDLE EAR DISEASE.

"ACUTE OTITIS MEDIA", by W. M. Mollison, is another of the pocket monographs on practical medicine.[1] For a volume of its size, it sets out quite fully and explicitly the nature and treatment of acute infective processes in the middle ear, plainly stating the cardinal symptoms and changes. The subject of relief and cure is well discussed, with reference both to the local measures directed to the ear itself and to the all-important primary factors in the nose and throat.

It is possibly unwise in a text book intended only for the relatively inexperienced to suggest that there is a type of acute otitis in which *paracentesis tympani* may be delayed; it would be safer perhaps for the author only to stress: "when in doubt, operate." Whether small volumes in essay form and without illustrations will prove sufficiently appealing for the reader to peruse them carefully and to retain their teaching is a further point for query. On the other hand, cheapness and a minimum of pages to be traversed should lead to this book's finding a place in the busy practitioner's library, where speedy refreshing of the mind is often a desideratum; even this purpose, however, we feel is better served when illustrations supplement the text.

BIRTH CONTROL.

A "PHYSICIANS' MANUAL OF BIRTH CONTROL", by A. F. Konikow, is a very complete and up-to-date statement on the matter.[2] Full descriptions of the relative advantages and failings of the different methods are clearly set forth.

The authoress prefers a combination of some type of vaginal pessary with an antiseptic paste, followed by douching. Even with these precautions failure occurs in over 3% of cases. She employs a stock of about twenty different pessaries; but whether such a variety is absolutely necessary, she does not definitely state.

Condoms are advised for the newly married or those who cannot be fitted with a pessary on account of large rectoceles, stoutness or vaginal sensitiveness.

There are sixty-eight detailed tables of results which may be of interest to some. She very wisely emphasizes the dangers of the intrauterine type of pessary, intrauterine treatments designed to destroy the mucosa, and X radiation.

The possibilities of biological methods are discussed, but they are still in the experimental stage only.

The book can be highly recommended as a dispassionate survey of the subject.

[1] "Some Radium Cases at the Middlesex Hospital: A Photographic Record", by A. Cameron Macleod, M.B., B.S., F.R.C.S.; 1931. London: John Murray. Demy 8vo., pp. 162, with 122 plates. Price: 7s. 6d. net.

[1] "Pocket Monographs on Practical Medicine: Acute Otitis Media", by W. M. Mollison; 1932. London: John Bale, Sons and Danielsson, Limited. Foolscap 8vo., pp. 71. Price: 2s. 6d. net.

[2] "Physicians' Manual of Birth Control", by A. F. Konikow, M.D.; 1931. London: Baillière, Tindall & Cox. Royal 8vo., pp. 258, with 21 illustrations. Price: 12s. 6d. net.

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE ATTENDANCE AT SCIENTIFIC MEETINGS.

THE numbers of medical practitioners attending scientific meetings of the British Medical Association form a very small proportion of the total number of members who could attend if it so pleased them. The reasons for this lack of interest are numerous. One reason is the attitude of superiority affected by some people. These people deserve little comment and may well be left to their smug self-satisfaction; but one of their arguments is perhaps worthy of mention. They say that the papers and discussions at scientific meetings of the British Medical Association can teach them nothing. Of course, a person who makes such a statement is usually superior only in his imagination and his attitude. Let it be assumed for a moment that the superiority is real. Does it excuse its possessor from lighting the darkness in which, he believes, those who attend scientific meetings are stumbling? Does it excuse him from the task of attending the meetings in the hope, vain perhaps, of raising their tone to something approaching that to which he is accustomed in his self-communion? If he is altruistic as well as superior, he will do these things and many more.

Fortunately, the superior people are few. Commoner reasons for failure to attend meetings are indifference and even sheer laziness. At no time could a medical practitioner afford to be indifferent to the views of his fellows; at a time like the present, when medical knowledge (along certain lines) is increasing with great rapidity, when therapeutic methods are undergoing constant modification, and when the very conception of the nature of disease almost appears likely to be changed, an attitude of indifference is inexcusable.

Laziness is perhaps the most common reason for absence from scientific meetings. The tired medical practitioner finds it too difficult a task to tear himself from the comfort of his home, or to forsake the theatre or the game of bridge, in order to join in a discussion, or listen to a discussion, on the work at which he has been occupied the day long. Let us not judge him too harshly; rather let us remind him gently of his duty. There are many, however, who have not the slender excuse of tiredness; let them be censured with all severity.

If an investigation were made, it would be found that poor attendances at scientific meetings are largely due to the attitude of the general practitioner. Most of those present at the meetings are men engaged in consulting practice. Certainly, many general practitioners are unable to attend; many others make no effort. The meetings are of greater value to the general practitioner than to the man who confines his activities to a particular branch of medicine or surgery. The latter has greater leisure for reading, has more time to spend on the study of his patients, and usually has a great wealth of material in his work on the honorary staff of a hospital, as well as the advantage of daily communion with men engaged in the practice of various specialties. The general practitioner, though he has to keep in touch with general developments in all departments of his profession, has less time for study. He must attend every meeting that he can attend, if he wishes to keep abreast of the times. He may plead that he has not the time to attend meetings. He must indeed be a busy man who cannot spare some dozen evenings a year to the betterment or refreshment of his knowledge. It would perhaps be to the benefit of his patients

and himself if he were a little less busy. Some general practitioners are kept away from meetings by the fear that by leaving their homes for a few hours they may lose an occasional patient. Some sense of business, of course, is an essential to existence; but occasionally it becomes tainted with cupidity.

A general practitioner in Sydney remarked that he seldom attended meetings of the New South Wales Branch of the British Medical Association as he felt that they were controlled by a coterie of Macquarie Street practitioners by whom the general practitioner was regarded rather as an outsider. This, of course, is an absurd view, and is mentioned here only because of the possibility that others may hold a similar.

Although the general practitioner is the one who most requires the stimulating influence of scientific discussion, it must be admitted that he has more excuse for non-attendance than the man whose work finishes with the close of day. The dangers of a too narrow specialism have been stressed again and again. Most specialists see these dangers; the remainder for the most part pretend that they see them; all insist that a knowledge of general medicine is necessary in the good practice of a specialty. Yet how often is an ophthalmic surgeon or an oto-rhino-laryngologist seen at a meeting convened for the discussion of a subject in general medicine? When is a surgeon seen at a meeting of physicians, or a physician at a meeting of surgeons?

Many medical practitioners do not take the trouble to attend Branch meetings because they know that sooner or later they will be able to read the papers and the reports of the discussion in THE MEDICAL JOURNAL OF AUSTRALIA. It is unnecessary to mention what the result would be if all medical practitioners adopted this attitude. The spoken word is often more convincing that the written, and the written loses the interesting, perhaps witty, asides that the accomplished lecturer employs to lend point to his remarks. But the value of scientific meetings is not solely in the messages delivered by the various speakers; the medical practitioner broadens his outlook and advances his education merely by mixing with his fellows; and if he is a sociable soul, he can find some pleasure in the making of new and the renewal of old associations.

He is in danger who wraps himself in his own thoughts and confines himself to a little workaday world of his own making. He is ungenerous who has learning to impart and makes no effort to impart it.

Current Comment.

THE MOBILITY OF THE ABDOMINAL VISCERA.

MEDICAL history is always interesting. It is not, of course, a record of unbroken success or of consistent truth; but even the sources of error are helpful. Errors have been due to ignorance, prejudice, lack of precise methods of investigation and, last but not least, an exaggerated estimate of the degree of precision to be attained by investigators. The history of the knowledge concerning the abdominal viscera illustrates this. During the sixteenth, seventeenth and eighteenth centuries some little was learnt about abnormalities in the position of the stomach, caecum and colon, but no conclusions were drawn from this knowledge. Indeed, up to the first half of the nineteenth century, when Glénard raised it to the dignity of a disease, little significance was attached to this condition. Surgery and radiology have continued to exploit this field, and it is known that the stomach, gall-bladder, caecum and colon may present great variety of shape and position in healthy people. The really important point is not the contour and place of these organs, but their functional capacity, and there is little doubt that quite unwarranted conclusions have often been drawn in this respect. These conclusions have been based chiefly on radiological evidence, though it should be said that it is the clinician rather than the radiologist who has run away with wrong ideas.

The fact is that the hollow abdominal viscera can function perfectly well in positions of extraordinary diversity. To realize the truth of this, the obvious but important fact must be grasped that these organs must be extremely mobile and that bodily posture and activity must cause considerable variation in their mutual positions without the impairment of function.

This point has been well illustrated by A. E. Barclay in a recent study on the mobility of the abdominal viscera, in which he has succinctly reviewed the literature and recorded some careful observations.[1] These studies take the form of photographic records of healthy subjects, the bony landmarks being superimposed on the surface, together with the outline of the barium-filled organs, and they are used to point the author's observations made during twenty-five years' work. It is not

[1] *The Quarterly Journal of Medicine*, April, 1932.

necessary to detail all the findings here. The demonstration is clearly made that mobility and fluidity are essential characteristics of the abdominal organs, and that bodily habit, posture, respiration and emotion may and do cause movements that appear to be distortions but that do not affect function.

How careful should the medical practitioner be, then, not to ascribe symptoms to conditions revealed by X rays that may well be within the bounds of the normal. Still more careful should he be to refrain from meddling with something that may be harmless. It is not for a moment suggested that there are no evil results that may accrue from malposition or distortion of organs—duodenal ileus is an example. But visceroptosis and the like have been made too much of. As Barclay points out, Allbutt dealt with the subject in 1884 in lectures on visceral neuroses, and this is in general where the subject belongs. Every practitioner of internal medicine must have essayed to treat patients who are acutely aware of their "dropped" stomachs *et cetera*; he should at least realize that his own viscera may be "dropped" to an equal degree without his being aware of it.

ARTHRITIS AND DIET.

IT is characteristic of the modern study of disease that the systems affected are not by any means the only ones subjected to critical review. Sometimes, indeed, this wide casting of the net of investigation tends to make the onlooker lose sight of the original quest, as when certain enthusiasts in studying the changes found in such a disease as nephrosis make us almost forget that the kidney is concerned. Nevertheless this tendency to look far afield for factors of ætiological, and therefore perhaps therapeutic, importance is to be welcomed in clinical medicine.

Such a disease as chronic arthritis, with its varied symptom-complex and still more varied or doubtful ætiology, is a case in point. Of course, everyone is aware of the importance of seeking septic foci and correcting any known aberrations of bodily function, and the alimentary tract has shared in these attentions.

Ralph Pemberton and E. G. Peirce have made another useful contribution to the study of digestive function in arthritis; Pemberton's authority insures the value of this work.[1] They have observed that the sufferer from *arthritis deformans*, in many instances, possesses an enlarged and tortuous colon deficient in haustration. They suggest that arthritis is often caused by an infection in the beginning, but that this abnormal state of the bowel, whether congenital or acquired, may also be an important factor. Whether the changes described necessarily imply dysfunction is a matter for argument, but the case histories quoted by Pemberton and Peirce certainly appear to show that normal tone and haustration have returned to the bowel, and that coincident improvement has occurred in the patient's joints, especially as regards the range of movement. It will, of course, be understood that no claim is made for dramatic improvement in the condition of joints that have suffered serious organic change, such as disorganization or ankylosis. But Pemberton points out that a surprising degree of restoration of function is sometimes seen, and quotes his previously published experiences in the army. It is interesting to recall that improvement in these war-time cases sometimes occurred under conditions of definite under-nutrition; for the method of treatment adopted in the present series is a special dietary scheme designed to secure physiological rest to the digestive organs.

Now diet in arthritic troubles has been the subject of much argument. There are still those whose reaction to the sight of swollen distorted joints is, almost after the fashion of a conditioned reflex, to order a low protein diet. On the contrary, most medical practitioners try to consider the usually lowered nutritional state of the patient by giving him a liberal mixed diet, with usually some limitation of carbohydrates. A recent addition to this scheme is the use of insulin and glucose. Now, however, Pemberton and Peirce come forward with the suggestion that there are certain cases in which the use of a diet of low caloric value is distinctly beneficial. They claim that by producing a temporary state of under-nutrition they have effected not only clinical improvement, but also changes observable by X rays in the colon, the abnormal redundancy and smoothness being in part replaced by a more normal appearance. The patient is put to bed and given a diet roughly as follows. On the first day the juice of three oranges alone is given. On following days clear coffee with a teaspoonful of sugar is added, then strained vegetable soup and a few biscuits; by the sixth day a semi-liquid diet is being taken, and on the seventh day a diet with a value of 1,000 calories. Thereafter 1,200 calories only are given until the thirty-eighth day, and thereafter 1,465 calories. This last diet is made up of 68 grammes of protein, 78 grammes of fat and 121 grammes of carbohydrate, and consists chiefly of milk, white meat, vegetables and fruit. Pemberton and Peirce emphasize that the cases must be properly selected and that such a dietary must not be used indiscriminately; for, as they justly remark, "under-feeding for any purpose is a two-edged tool which must be circumspectly used". They consider that the vitamin content of the food is not related to the improvement noted, though they do not belittle the value of the vitamins in diet.

Naturally, the treatment of arthritis can never be a matter of fixed routine, for judgement, that indescribable and incommunicable gift of the good therapeutist, must set the course. And here again we see that our ideas should not remain fixed, and diet, the subject of so many fads, yet so many earnest inquiries, may again prove worthy of fresh investigation and trial along these lines.

[1] *Annals of Internal Medicine*, April, 1932.

Abstracts from Current Medical Literature.

GYNÆCOLOGY.

Anaerobic Streptococci in the Vagina.

S. D. SOULE AND T. K. BROWN (*American Journal of Obstetrics and Gynecology*, April, 1932) consider the question of puerperal infection in the light of the study of the organisms occurring in the normal vagina. Two hundred and seven vaginal cultures were taken from 103 white and coloured patients of the obstetric clinic of the Washington University out-patients' department. The patients were unselected and they were not given any instructions as to preparation before the culture was taken. The cervix was exposed and the cultures were taken directly from the cervix itself. The authors give tables of their results, which show that aerobic hæmolytic streptococci were not found in any of the series. Anaerobic growth was found in 60% of all patients. Anaerobic streptococci were isolated in about 40% of all cases, and were noted more frequently in *primiparæ* than in *multiparæ*. The authors conclude that anaerobic streptococci can and do give rise to all grades of puerperal sepsis, and they support the conclusion of Rosowsky that "these bacteria live saprophytically in the vagina, but under certain conditions following abortion or delivery they can cause severe sickness". The authors state that a definite improvement follows the use of vaginal instillations of mercurochrome, iodine and glycerine during labour. A 1% solution of neutral "Acriflavine" in glycerine gives even better results. The authors consider that puerperal infections due to anaerobic streptococci are frequent and often serious. They regard them as chiefly endogenous in origin, and urge the use of prophylactic antiseptic vaginal instillations.

The Menstrual Histories of University Women.

RUTH E. BOYNTON (*American Journal of Obstetrics and Gynecology*, April, 1932) carried out a series of investigations on the menstrual histories and physical examinations of 2,282 American university women. A complete physical examination, except for a pelvic examination, was made of each student. The menstrual history was recorded by the student at the time of examination. The author discussed with the student any abnormal menstrual symptoms which appeared in the history, and classified her as to menstrual function, each student being placed into one of four groups: those with normal menstruation, those suffering from dysmenorrhœa, those suffering from irregular menstruation, and those with amenorrhœa. It was found that dysmenorrhœa occurred in 20·38% of women students. The percentage increased as the age increased up to twenty years, and there was a marked increase over that age. The lower the age, the lower the incidence of dysmenorrhœa was found to be. Physical exercise as reported by the students did not seem to have any particular bearing on the occurrence of the dysmenorrhœa; neither did posture. The mean systolic blood pressure, the mean height-weight percentage and the mean hæmoglobin percentage were significantly lower for those who had pain than for those who had no pain, while the percentage of dysmenorrhœa occurring in a group of students who might be classified as "highly strung", was apparently lower than in a group which was not in this category.

Menorrhagia Due to Hypothyreoidism.

W. C. WATERS AND GEORGE A. WILLIAMS (*American Journal of Obstetrics and Gynecology*, April, 1932) have examined a series of cases in which menorrhagia has been due to hypothyreoidism. In six such cases they have followed up the history and the physical condition of the patient. They find that excessive bleeding is the commonest menstrual disturbance associated with diminished thyreoid secretion. In patients of any age where a definite pathological condition of the pelvis cannot be found and there is excessive menstruation, they urge that a course of thyreoid gland treatment should be given before operation is tried. They consider that hypothyreoidism may occur in the presence of an apparently normal basal metabolic rate. They strongly urge the use of thyreoid gland in all cases of diminution of thyreoid activity.

Lumbo-Sacral and Sacro-Iliac Strain.

W. A. COCHRANE (*The Journal of Obstetrics and Gynæcology of the British Empire*, Autumn Number, 1931) reviews the present knowledge of low back pain in gynæcological practice due to lumbo-sacral and sacro-iliac strain. He urges the necessity of an eliminative diagnosis. When the pain arises in the back itself, there is a group of conditions which are essentially orthopædic, mainly from chronic strain of the lumbo-sacral and sacro-iliac joints. The special symptoms associated with joint affections are local tenderness, muscle spasm and deformity. These are not always easy to observe in deep joints. The anatomical type or physique of the patient suffering from low back pain must first be considered. In slender individuals there are small bones and shallow joints. There may be an extra lumbar vertebra. The long thin spine cannot withstand the strain of life so well, and the patient gets a dull ache across the shoulders and lower part of the back. In these cases there is no muscle spasm. Rest generally relieves, but the pain returns when they take exercise. Poor posture and bad bodily mechanics account for another group. All the antero-posterior curves of the spine are exaggerated. The body weight falls through the lumbo-sacral arch and not through the vertebral body. This is particularly true of heavy people with big abdomens and poor muscle control. A condition of fixed lordosis is likely to arise in these people. Tenderness is present midway between the posterior superior and the posterior inferior iliac spines and on upward pressure in the great sacro-sciatic notch. There is hamstring and sciatic scoliosis in some cases. In difficult cases stereoscopic and lateral radiographs of the lower part of the back are necessary. Anatomical variations from the normal may affect the transverse processes, the articular facets and the spinous processes. The common variation of the fifth lumbar vertebra is that of semi-sacralization, which causes cross strain through the unevenness of the two sides of the back. Advancing age, poor posture, trauma and loss of muscle tone, all may help in bringing the condition to notice. The author points out that the problem is often a combined problem and must be analysed carefully. He recommends rest, massage, heat, reeducation of the muscles and support of the spine and the pelvis. He puts his patient to bed for three weeks on a very firm mattress. Three times a day she is given special exercises for the front and back of the trunk. The back is massaged and special exercises are recommended after the first week. A strong corset, lacing at the back, is often required for a time. Fifty-five patients have been treated in the past two years. All gynæcological conditions have been treated by surgery. Of 47 cases dealt with, 14 were cases of iliac strain and 33 of chronic lumbo-sacral strain. Of the former, two were acute and 12 were chronic. In the acute cases manipulation under an anæsthetic effected a cure. Of the 12 patients suffering from chronic strain, eight are cured, two relieved and two are a little better. Of the lumbo-sacral group, 17 are cured, nine are relieved and 7 are not much better.

Uterine Hæmorrhage.

BECKWITH WHITEHOUSE (*The Lancet*, January 3, 1931) has reviewed the present position in regard to uterine hæmorrhage, with special reference to malignant disease. During 1929, 4,428 women died in England and Wales from malignant disease of the uterus. The author emphasizes the necessity for careful investigation of all irregular and increasing uterine hæmorrhage, particularly in women who have borne children. He has reviewed the present views as regards the menstrual function, and discusses the influence of œstrin, the relation of œstrus and ovulation. Occasional postmenopausal hæmorrhage can probably be explained by a delayed or late ovulation. In these cases the uterus itself is found to be normal for the age, and curettage produces no malignant tissue. A polypus of an adenomatous type is occasionally found in the uterus after the menopause. This in itself is sufficient to cause irregular hæmorrhage. The author emphasizes

again the urgent necessity of investigating all cases of post-menopausal hæmorrhage with the curette. He discusses the various types of menorrhagia which may occur at the menopause apart from malignant disease, particularly in regard to *fibrosis uteri*. The final diagnosis, however, in every case rests with curettage and examination of the scrapings. He reviews the various causes of coitional hæmorrhage, and points out that bleeding may follow coitus when the cervix is the seat of an extensive erosion and ectropion or from a simple polypus. In every case, however, a thorough physical examination should be made. He ends with a plea for the impressing on all women of advancing years the need for investigation of irregular hæmorrhage.

OBSTETRICS.

The Examination of the Placenta.

M. FETZER AND H. LABES (*Monatsschrift für Geburtshülfe und Gynäkologie*, January, 1932) describe the results of their investigation of the reliability of the Sachs's test for the completeness or otherwise of the placenta. According to Sachs, if air be injected into the umbilical vein in the cord and the placenta placed in water, it will float if the placenta be complete, otherwise it sinks wholly or partially. The authors show that when the placenta definitely sinks there is always some cotyledon missing or a definite tear in the placental tissues. But doubtful cases in which the placenta floats in an oblique or vertical position, do not necessarily prove that the placenta is incomplete. In such cases careful visual inspection is always essential to verify the diagnosis of incomplete placenta.

Pregnancy and Labour Complicated by Fibroid Tumours.

B. P. WATSON (*American Journal of Obstetrics and Gynecology*, March, 1932) found fibroid tumours complicating labour in about 1·5% of cases. Fibroids are more common in elderly *primiparæ* than in *multiparæ* of the same age. The younger the patient when she becomes pregnant, the less is the likelihood that fibro-myomata will develop. The presence of fibromyomata is frequently associated with sterility. The author has noted that pregnancy following myomectomy often terminates in abortion at the first conception, whereas the following pregnancies are carried to full term. The same phenomenon frequently follows a simple suspension of the uterus. A suggestion is made that one year should elapse between the time of operation and pregnancy. By a large number of patients in whom the fibroids are small, no disability is experienced. Fibroids are, however, frequently associated with uterine inertia. As pregnancy proceeds, large multiple tumours may become less defined owing to a certain degree of softening. And it is astounding in many cases how the abdomen accommodates itself to the large tumours and the growing uterus. As regards the child, there does not appear to be any added risk of deformity. Red degeneration, however, is a moderately common complication; experience has shown that even when this complication occurs early in pregnancy, it is generally possible to tide the patient over to term or to a time of viability of the fœtus. Operative intervention is, however, necessary at times. In labour the presence of fibroids often leads to complications, operative delivery being necessary quite frequently. The possibility of an associated myocardial lesion must always be borne in mind. The author does not subscribe to the theory that myomectomy should be performed in all cases early in pregnancy. Myomectomy done early in pregnancy is likely to cause abortion. Many patients, by being treated on their merits, may be carried along to a successful issue either by the slipping up of the tumour as the cervix dilates or by Cæsarean section with myomectomy or hysterectomy. When there are several tumours of the larger type, uterine contractions are adversely affected, and for this reason, if the patient is a *primipara* over thirty-five years of age, the safest method may be Cæsarean section.

Artificial Vagina.

W. STOECKEL (*Monatsschrift für Geburtshülfe und Gynäkologie*, January, 1932) describes in detail three operations for the formation of an artificial vagina. The method of Wagner-Kirschner was employed. In this method the artificial vagina is composed of skin flaps from the thighs. Full details of the technique are given. Emphasis is laid first on careful preparation of the site of the artificial vagina and on the prevention of infection. After the flaps have been secured in position the author prefers to use a tampon of sponge rather than one of dental wax, which is too hard and prevents drainage of any secretions. Despite infection in some cases, he found that the end-results were better as regards patency of the vagina than in others in which apparently primary union had occurred.

Osteomalacia in Pregnancy.

OSTEOMALACIA is regarded by the authors of text books as a rare disease. W. J. Dieckmann (*American Journal of Obstetrics and Gynecology*, April, 1932) believes that its occurrence in an early stage is far more common than is generally supposed. Pain in the joints, especially in the pubic symphysis, and cramps in the legs, are early signs. It is not necessary to wait till rarefaction of bone or a deficiency of serum calcium is apparent before a diagnosis is made. The development of the teeth begins at the sixth month of intrauterine life. At birth all of the temporary teeth are calcified and the crowns of the first permanent molar teeth are partially calcified. So the diet of the mother is an important factor in the well-being of the mother and child. The condition is more likely to occur when there has been a short interval between pregnancies. A diet containing a minimum of 1·5 grammes of calcium and two grammes of phosphorus, with sufficient butter, milk and fruit, and in some cases cod liver oil, would go far to improve the health of the mother and the teeth and stamina of the child.

Trichomonas Vaginalis.

E. CORNEL, L. J. GOODMAN AND M. MATTHIES (*American Journal of Obstetrics and Gynecology*, September, 1931) have investigated the vaginal discharge from 581 pregnant women at the Chicago Lying-in Hospital. They found *Trichomonas vaginalis* in 7·6%. As many women had used a douche before presenting themselves for examination, the figure may not be accurate. When *Trichomonas vaginalis* is examined by the hanging drop method, it is seen as a flagellated body characterized by four anterior free flagellæ which tend to adhere in one strand basally. There is a posterior axostyle. Trichomonas may be present without producing any symptoms except some excess of discharge. The acute symptoms are typical. Itching is present, with soreness and discharge moderate to excessive. On examination the vaginal wall is covered with a light yellowish green discharge containing many pin point bubbles. The vagina frequently has small red raised spots on it; the term strawberry vagina is applied to this condition. Amelioration of the symptoms can readily be obtained by keeping some germicide in contact with the vaginal wall; but to eradicate the organism completely is a more difficult matter. The only treatment offering any permanency is that described by Kleegman, in which Lassar's paste is applied on tampons to the vagina, which has been previously cleansed with soap and water and mercurochrome.

Effect of Quinine on the Uterus.

K. SCHÜBEL (*Münchener Medizinische Wochenschrift*, October 2, 1931) describes the pharmacological effect of quinine on the uterus. Its action depends not only on the method of administration, but also on the dosage. Intramuscular injection is the most satisfactory method to use. Quinine given in small doses stimulates the sympathetic system, but acts as a paralysing agent when large amounts are given. When given in small doses, 0·05 to 0·1 gramme for a woman weighing fifty kilograms, it acts by sensitizing the uterus to both mechanical and chemical stimuli. In particular the administration of such amounts renders effective small injections of pituitary extract. The author recommends the use of small doses of quinine in every pregnancy during the latter months.

Special Articles on Aids to Diagnosis.

(Contributed by Request.)

CHOLECYSTOGRAPHY.

CHOLECYSTOGRAPHY is the radiographic demonstration of the gall-bladder by the use of a drug which renders the bile radio-opaque.

Early in 1924 the first description of a method of utilizing the intravenous injection of tetrabromphenolphthalein appeared. This was the origin of present-day cholecystography.

Intravenous injection was at first the only method of administration. Later the oral method was introduced, but not extensively used, owing to uncertainty in the absorption of the dye. With subsequent improvements in the form of the dye the oral method of administration has now become definitely established in the clinical investigation of diseases of the gall-bladder. At the present time either the oral or intravenous route is used, according to the radiologist's preference.

Indications for the Use of Cholecystography.

Possible diseases of the gall-bladder should be investigated in those patients who complain of pain or discomfort in the upper part of the abdomen. Towards this end cholecystography and the opaque meal examination may be used, and frequently it is necessary to combine both methods. When time permits, gastric lesions should be first excluded by means of a barium meal examination, but when the time at the patient's disposal is limited, the cholecystographic examination should precede the meal. If the order of investigation is reversed, the presence of barium in the intestinal tract may obscure the shadow of the gall-bladder.

Contraindications to the Use of Sodium Tetraiodophenolphthalein.

The contraindications are deep or acute jaundice, advanced myocardial disease and extreme debility. In deeply jaundiced patients it is mechanically difficult, or perhaps impossible, for the bile to enter the gall-bladder, and actually it has been found that the gall-bladder in this type of patient practically never casts a cholecystograph shadow. In patients with acute jaundice the symptoms are aggravated by the use of the dye. A case is recorded in which the use of the iodized salt was followed by a fatal result, due to softening and destruction of the liver substance, supposedly by the drug. In dealing with patients presenting the second and third conditions, it will be apparent that a drug with toxic properties should not be used.

Methods of Administration.

Sodium tetraiodophenolphthalein may be administered either by the oral or intravenous route.

The intravenous method is perhaps the more accurate of the two; but results have shown that in the majority of cases administration by the oral route is sufficiently accurate for practical purposes. It is also easier to carry out and is less objectionable to the patient. It requires, however, more preparation on the part of the patient, and also his intelligent cooperation. In instances where the gall-bladder has failed to fill after the oral administration of the drug, it should be repeated, or the intravenous method used instead, so that the failure of the gall-bladder to fill at the first examination may be verified.

Instructions to and Preparation of the Patient.

Whichever method is used, the colon must first be thoroughly emptied. For this purpose castor oil is the most suitable evacuant, and it should be given the night before the dye is to be administered. A preliminary radiograph before the administration of the dye is not necessary. When the intravenous method is used, the dye is injected into a suitable vein and radiographic examinations made thereafter at specified intervals, generally six, eight and ten hours after the injection. When the oral method is used, the examinations are made on the day after the ingestion of four grammes of the dye. The first series of radiographs are made about twelve hours, and the second series about fifteen hours after the dye has been taken. For the third series the patient is instructed to have a meal containing fats and egg yolk, and to return one or two hours later, that is, about eighteen hours after the opaque dye has been ingested, or, if the intravenous method has been used, about ten to twelve hours after the injection of the dye.

Although some observers state that these precautions are unnecessary, it is usual to instruct the patient as follows: (i) He should have no fats or eggs in the meal prior to the taking of the opaque dye; (ii) he should have no food from the time of the ingestion of the opaque dye until after the second series of radiographs; (iii) he should have no hot beverages, but he may drink cold water freely on the morning of the examination. If, after the second series of radiographs, there is no shadow representing the opaque gall-bladder, an additional interval of two hours is allowed and another series of radiographs taken. If, on the other hand, there is a shadow of the dye-filled gall-bladder, the patient is instructed to have a meal containing fats (which stimulates the gall-bladder to empty) and to return two hours later for the third series.

With the present form of the dye used for oral administration, vomiting and diarrhœa are rare; but they may occasionally occur. Unless they are severe and occur immediately after the dye has been swallowed, they do not, as a rule, adversely affect the production of the opaque bile. Occasionally, when the intravenous method is used, there are more serious reactions. These are similar in effect to shock, and may be accompanied by rigor and vomiting.

Mechanism of Absorption.

In order intelligently to interpret radiographs taken after the administration of the opaque dye, it is necessary to understand what happens after its ingestion and absorption, and the causes leading to the production of the gall-bladder shadow. After oral administration the drug reaches the liver through the digestive tract, whereas after intravenous injection it passes directly to the liver *vid* the blood stream. Consequently, in interpreting radiographs obtained after using the latter method, there is no need to consider whether the dye has been satisfactorily absorbed by the digestive tract, nor is it necessary to allow so long an interval to elapse before subjecting the patient to radiographic examination. By whichever route the dye is administered, it is eventually secreted by the liver and passes with the bile to the gall-bladder and later back again into the intestine along the usual channels.

The concentration of the bile is said to be the main function of the gall-bladder mucosa. This applies also to the mixture of bile and opaque salt. It therefore follows that the shadow of the healthy gall-bladder shows an increased density and a slight diminution in its size in the second series of pictures in comparison with the first. Diseased conditions of the mucosa diminish the concentration of the bile and consequently of the dye, and therefore the shadow of the gall-bladder is of poor density, which does not tend to increase at subsequent examinations.

Obstruction in the hepatic, cystic or common ducts may delay or even prevent the entrance of the dye into the gall-bladder.

If the obstruction in the cystic duct be of the ball-valve type, it may not prevent the entrance of the bile into the gall-bladder, but its exit, thereby causing delay in emptying. The explanation why obstruction in the common bile duct causes lack of filling is that by interfering with the emptying of the gall-bladder, the opaque bile is prevented from entering. Obstruction in the common duct may also cause delay in the evacuation of opaque dye from the gall-bladder.

Radiography.

In the examination of the shadow cast by the opaque gall-bladder radiographic and fluoroscopic methods may be combined. Although the fluoroscopic image is lacking

in the finer details that can be seen in the films, the former enables the examiner to determine the degree of mobility and flexibility of the gall-bladder. Some observers state that distinct gall-bladder contractions occur during emptying and are visible during screen examinations. My own experience is that there is merely a diminution in size after a meal containing fats has been taken, and it is probably due to a gradual contraction of the muscular walls of the gall-bladder.

Films of good quality are needed for satisfactory interpretation. Contrast is improved by using the Potter-Bucky diaphragm. X rays of suitable penetration must be used, and should vary with the thickness of the patient's body. Rapid exposures must be made so that blurring of the pictures caused by respiratory movements may be eliminated.

In position the gall-bladder follows the same rule as the other abdominal viscera; that is, in a patient of a broad build there is a high gall-bladder, whereas in a patient with a long, thin body, the gall-bladder is low and elongated. In consequence of these variations in build it is necessary to vary the relative positions of the tube, the film and the patient.

Lateral views may also occasionally be required. When radiographs are being taken it is usual to place the patient face downward on the table and to centre the tube over the space between the right twelfth rib and the iliac crest. It is important so to place the patient and to centre the tube that the shadow of the spine does not overlap the region of the gall-bladder. When patients of stout build are being examined, the tube is centred slightly higher than it would be when the patients are of the long thin type. The size of the film should be large enough to insure that the area containing the gall-bladder is sufficiently covered.

Interpretation.

The Healthy Gall-Bladder.

In a cholecystograph of a healthy gall-bladder the following features are observed:

1. *Filling Time.*—Normally the gall-bladder commences to fill in from six to eight hours after the ingestion of the dye, and it should be completely filled in twelve to fourteen hours.

2. *Density of the Shadow.*—The opaque shadow is of average uniform density.

3. *Shape and Size.*—The shadow of the gall-bladder is normally pear-shaped and smooth in contour. There is an average size for individual types. Its capacity may vary from 28 to 42 cubic centimetres (one to one and a half fluid ounces).

4. *Position and Mobility.*—It may be situated anywhere between the costal margin and the iliac crest, and from the mid-line or slightly to the right of the mid-line, to almost the right lateral line of the body. Its position depends upon the build of the patient in much the same manner as the position of other abdominal viscera. In cases of transposition of the viscera the gall-bladder is situated on the left side and its shadow will be absent from views which include the right side only. This abnormality can usually be detected by an alteration in the shape of the shadow cast by the liver margin. In cases of visceroptosis it may even be situated below the iliac crest. Its mobility also varies in different types of patients. It is more mobile in the hypotonic than in the broad type, in which its mobility is very limited.

5. *Concentration Time.*—Sixteen hours after the dye has been ingested its concentration should be at its maximum, and in the second series of radiographs the gall-bladder shadow should be slightly denser and smaller than in the first.

6. *Emptying Time.*—At most there should be only a small residue left in the gall-bladder one or two hours after a meal containing fats. The quantity of residue may vary slightly, but it should never be more than one-fourth of the full gall-bladder shadow. The gall-bladder should retract evenly as it empties, so that its position should be higher in the empty than in the full condition. This retraction should be followed in the series of radiographs.

Pathological Gall-Bladder.

Any pronounced departure from the normal functioning of the gall-bladder is indicated in the series of radiographs in the following manner.

1. *Lack of Filling.*—Total lack of filling is indicated by a complete absence of any shadow of the gall-bladder after sixteen or seventeen hours.

2. *Delay in Filling.*—Delay in filling is indicated by the shadow of only a partially filled gall-bladder fifteen or sixteen hours after the administration of the dye.

3. *Delay in Emptying.*—Delay in emptying is shown by a persistence of the opaque dye in the gall-bladder in a quantity greater than one-fourth, one or two hours after ingestion of the meal containing fats.

4. *Poor Concentration of the Dye.*—Poor concentration of the dye is displayed when the shadow of the gall-bladder presents very little contrast with those of adjacent structures; it may be taken that the dye is poorly concentrated. The shadow is often difficult to distinguish and does not increase in density in the later series of radiographs.

5. *Variation in Size and Shape.*—Variation in size and shape is evidenced by marked enlargement or deformity in the outline of the shadow.

6. *"Positive" or "Negative" Shadows.*—Certain areas of increased or diminished density that may lie within the general shadow of the gall-bladder or in the region of the cystic or common ducts, are usually described as "positive" or "negative" shadows. They are generally easy to distinguish. They should be demonstrable in succeeding films.

Various combinations of these evidences of abnormal function of the gall-bladder may determine more accurately the particular type of pathological lesion.

Cholecystitis.

Cholecystitis may be slight or severe. When it is slight the shadow of the gall-bladder lacks density; it may even be difficult to see and may be slow in filling. The density does not increase in the second series of radiographs. When there is a residue of more than one-fourth of the original quantity of the opaque dye in the gall-bladder after a meal containing fats (especially if the gall-bladder does not contract), it is suspicious. In severe cholecystitis there may be a complete absence of the gall-bladder shadow, even when the examination is prolonged beyond the usual time. An accurate radiological diagnosis is often impossible to arrive at with the evidence available.

Pericholecystitis.

Adhesions to neighbouring structures may result in displacement or distortion of the gall-bladder shadow. Occasionally pressure from adhesions causes delay in emptying. The portion of the gall-bladder distal to the pressure band may not empty in normal time. In addition, fluoroscopic examination reveals limitation of mobility to palpation. Fixation to other viscera may not only cause delay in emptying, but is frequently accompanied by imperfect retraction and consequent failure of the gall-bladder shadow to rise as it diminishes in size.

Biliary Calculi.

The complete absence of any gall-bladder shadow may be the only evidence of a calculus obstructing the hepatic, cystic or common duct. Unless there is additional evidence of the presence of calculus, the radiologist can only give an opinion that the gall-bladder is pathological. On the other hand, a biliary calculus often produces an opaque shadow, or may appear as an opaque (more or less) circular area or a series of opaque concentric rings. The reason for the alternate "negative" and "positive" ring shadows is that layers of radio-opaque lime salts have been deposited in alternate layers with cholesterin, which is non-opaque. The forms of the shadows may suggest the presence of facets. Opaque calculi produce "positive" shadows, and they may be demonstrated without the use of the gall-bladder dye. Non-opaque calculi are invisible unless they displace some of the opaque bile. They then appear as areas of diminished density (or "negative"

shadows) within the opaque gall-bladder shadow. When only one or two small calculi of either variety are present, they may not be detected until the gall-bladder has nearly emptied, because, owing to their size, they do not displace sufficient bile in the well filled gall-bladder to produce a contrast. Calculi may completely fill the space of the gall-bladder and thus totally prevent the entrance of the opaque bile. On the other hand, there may be sufficient room for some opaque bile to enter the gall-bladder, and in these instances it serves to make the calculi more evident. It is often impossible to differentiate between one or two small calculi and small polypi, although sometimes the position of the polypi is distinctive.

Simple Tumours.

Papillomata or polypi may occasionally be detected. They appear as small rounded areas of diminished density, due to filling defects. They are usually difficult to detect, for often they are not visible until the gall-bladder is nearly empty. The relative positions of the shadows of polypi do not vary in the gall-bladder as it retracts. On the other hand, shadows of small non-opaque calculi often change their relative positions in the gall-bladder as it empties and retracts.

Malignant Tumours.

Malignant growths of the gall-bladder may cause filling defects, just as neoplasms of the stomach cause irregularity in the outline of the barium meal. Unfortunately, malignant growths of the gall-bladder often affect the mucosa to such an extent that there is a complete lack of filling, and consequently a total absence of the gall-bladder shadow. The radiologist is then unable to give a more definite opinion on the gall-bladder than that it is pathological.

Hydrops.

Hydrops of the gall-bladder is occasionally demonstrable by a shadow indicating a large distended gall-bladder from which there is delay in the escape of the dye. The shadow is less opaque than that of the normal gall-bladder because it is filled with a weaker solution of the dye.

Sources of Error in Diagnosis.

Renal Calculi.—Stone in the kidney may generally be distinguished from opaque biliary calculi by the greater density of the shadow cast by the former; the shape of each variety is often characteristic. When the shadows of renal calculi are superimposed on the opaque gall-bladder shadow, it is necessary to radiograph the patient in the lateral as well as the postero-anterior position. The renal calculus shadow can then be seen to lie on a different plane to that of the gall-bladder.

Calcified Glands.—Calcified glands can be distinguished from biliary calculi in much the same manner, that is, by their shape and by the appearance after the patient has been X rayed in the lateral position. They are also at times more mobile, and may vary in position in a series of radiographs.

Hepatitis and Hepatic Carcinoma.—Hepatitis and carcinoma of the liver frequently result in a total absence of the dye in the gall-bladder. Unless there is a visible irregularity in the outline of the shadow of the liver, they can only be suspected. When the clinician considers that one of these conditions exists, he should mention it to the radiologist.

Pyloric Stenosis.—Pyloric stenosis may occasionally interfere with the satisfactory absorption of the dye after oral administration. By combining the barium meal with the cholecystographic examinations, gastric abnormalities may be excluded as possible causes of the non-appearance of the gall-bladder shadow. It has been stated that acute pyloric lesions are more frequent causes of this than are the chronic ones.

Disease of Abdominal Viscera.—Acute inflammatory disease of other abdominal organs, such as appendicitis or acute duodenal ulcer, may prevent the filling of the gall-bladder, and result in the absence of an opaque shadow. The reason for this has not been satisfactorily explained.

Intestinal Gas.—Intestinal gas shadows may appear as areas of diminished density within the shadow of the opaque gall-bladder. They may resemble biliary calculi in shape and may be mistaken for them. They can be distinguished by an alteration in their position in the radiographic series from within the confines of the gall-bladder shadow to a position quite or partly outside it. If the radiologist is still in doubt after the second series of radiographs, a simple enema should be given. This usually removes the gas.

Neglect of Instructions.—Neglect on the patient's part to follow instructions in the taking of the dye may result in delayed or imperfect filling; or the taking of food may result in the gall-bladder's being emptied before the second series of radiographs is taken.

Reflex Causes.—Delayed emptying may be due to some reflex cause. It is then generally accompanied by some gastric disturbance, such as vomiting. In these instances prolonging the period of examination usually enables the examiner satisfactorily to observe that the gall-bladder has emptied.

Pancreatic Calculi.—Pancreatic calculi may throw shadows; they are difficult to differentiate from biliary calculi. Fortunately, however, they are very rare.

Right-Sided Visceroptosis.—Mention should be made of right-sided visceroptosis, as it may result in deformity in the outline of the gall-bladder as well as alteration in its position, due to the pressure of abnormal bands between it and the hepatic flexure.

Extreme Mobility of the Gall-Bladder.—When the gall-bladder is extremely mobile, its shadow may be obscured by that of the spine, or it may even lie to the left of the spine shadow and be excluded from the area of the radiograph.

Conclusions.

By maintaining a high standard of radiography, and by carefully examining negatives in a good viewing box, the radiologist, provided he has experience in interpretation, should be able, with the aid of cholecystography, to reduce incorrect diagnoses in the detection of calculi and disease of the gall-bladder to less than 3%. This is a marked improvement on the results obtained prior to 1922, when a generous estimate of the correct radiological diagnoses was roughly 50%.

Since the incorrect interpretation of a pathological condition of the gall-bladder might lead to an unnecessary operation, the clinician should insist on the radiologist's being able to demonstrate clearly the evidence of pathology in the radiographs. The radiographic and clinical evidence should be in agreement.

Although cholecystography has been in use for less than ten years, it has brought about a pronounced improvement in the diagnosis of disease of the gall-bladder and has considerably increased our knowledge of liver function.

VAL. MCDOWALL, M.B., Ch.M. (Sydney,
Radiologist and Radium Therapeutist, Brisbane General Hospital.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on April 1, 1932, DR. E. S. MEYERS, the President, in the chair.

Presidential Address.

DR. E. S. MEYERS read his presidential address. This was published in the issue of this journal dated May 7, 1932.

The Electro-Coagulation of Tonsils.

DR. J. V. DUHIG and DR. R. GRAHAM BROWN read a joint paper entitled: "The Electro-Coagulation of Tonsils; Some Clinical, Pathological and Bacteriological Observations" (see page 1).

DR. A. J. REYE said that Dr. Duhig and Dr. Brown's paper appeared essentially a very fair one, and no one could take exception to the remarks on the necessity for the complete removal of tonsils. The title of the paper should have been "Some Failures in Surgical Diathermy of the Tonsils". Dr. Reye considered that if examples of surgical failure in dissection were examined, scar tissue and infection would be found. In a part like the mouth, scar tissue would not heal without some infection. In the Great War amputation wounds had been found still to contain bacteria in the healed-over tissue after a period of three months. In the specimens Dr. Duhig had shown, the bacteria were found in scar tissue. Dr. Reye would like to know how long before the bacteria subsequently disappeared and how long after operation in any scar tissue in the mouth would bacteria be present. The same arguments were used in the early days of the use of radium; specimens were shown with cancer cells that had escaped, and surgeons had insisted that only surgery was justified. These were merely the results of radium improperly used and did not really condemn radium treatment. The user had to be proficient in the tools he used. Four years before the meeting Dr. Reye had removed the tonsils of one patient by diathermy, and removal had appeared to be complete. However, the patient had not reported for a final inspection; six months ago the patient had had a very sore throat; some tissue that needed removal was found in the upper pole, as Dr. Brown had mentioned. But these cases were seen after dissection too. The first patient Dr. Reye had treated with diathermy for removal of tonsils, was a man who had been operated on twice before by a competent ear, nose and throat surgeon. The patient had insisted that his tonsils were still present. This, however, was not so, but there was unhealthy lymphoid tissue, which was removed in one sitting. This patient was still well and enthusiastic. If patients were recommended for diathermy by other patients who were satisfied after six and seven years, the treatment must be satisfactory. The question arose of arthritis caused by septic foci. Dr. Reye had known patients who had consulted ear, nose and throat surgeons and had tonsils removed, and antra and sinuses cleaned out, and were then found to have abscesses under the teeth. A search must be made for all foci of infection, and a practitioner who dealt with only one part of the body was apt to overlook some other points. He admitted that removal of tonsils was more difficult by diathermy than by dissection; but if a patient came who absolutely refused to have an operation on the throat because a relative or a friend had had an accident or hæmorrhage, or had developed pneumonia, what was the surgeon to do? Many patients were much improved and satisfied. Treatment must be carried out properly, and some people could stand more than others. Dr. Reye thought that even if dissection were the better method, many patients would not face it. With regard to the question of propaganda, he had heard much the same as Dr. Brown. Hæmorrhage did sometimes occur after diathermy treatment of the tonsils. Dr. Reye had had one patient who had previously suffered from severe hæmorrhage after tooth extraction; similar hæmorrhage had occurred after one of the diathermy treatments of his tonsils, but this had been easily controlled by coagulation and there had been no trouble at subsequent treatments. Dr. Reye said he quite agreed with everything Dr. Brown had said as to the difficulty in completely removing tonsils and in deciding when they had been completely removed. He used an electrode with a hooked end, and with this he could fell round for crypts and holes and draw the remaining tissue out and coagulate it. He had not seen any of Dr. Graham Brown's dissected tonsils, but he had seen many others. In one instance the pillars of the fauces on one side had been removed by the enthusiasm of the operator and half the tonsil left on the other side.

DR. W. J. SAXTON said that some time previously he had been in a country town two hundred miles from a city, and his tonsils had required removal. He had been treated with diathermy by a medical practitioner who had a very big surgical practice and who stood high in the estimation of other surgeons. He had also had experience of surgical diathermy for four years. In the treatment swabs of a 10% solution of cocaine had been applied to each tonsil for some time before the commencement of the operation. Each treatment had been very painful. The first day after treatment he had felt well; on the second day the soft palate had become swollen and the uvula œdematous; he could not swallow and had felt as if he were suffering from an attack of acute tonsillitis. This had lasted for fourteen days, during which time he had felt ill and had experienced difficulty in doing his work. He had had six treatments in all and had then given it up. Some tonsil tissue had been left, but both he and the diathermist had been content to let it be. Since then he had had the tonsillar remains enucleated under a general anæsthetic. He had been quite comfortable in respect of the latter operation and anæsthetic, and was satisfied it was the best method.

DR. J. S. BARR-DAVID said that in 1907 he had had tonsillotomy performed. Tonsillitis had become more frequent. In 1917 the tonsillar stumps had been removed. In 1925 some septic fragments had still been present, and, as he had been attacked by painful rheumatism of the sterno-costal articulations, he had had these fragments removed by a senior throat surgeon in Melbourne. The position today was that there was no lymphoid tissue where his normal tonsils should be, that site being occupied by much scar tissue; one anterior pillar was missing, and there was new lymphoid tissue behind the posterior pillars of both tonsils. In one of these masses of lymphoid tissue there was actually a crypt. Sore throats still occurred at times, and then that lymphoid tissue became hypertrophied and columns of it could be seen. Dr. Barr-David remembered having read, a couple of years previously, a letter in *The British Medical Journal*, in which there was a description of how, after tonsillectomy, two new tonsils had appeared behind the posterior pillars and had behaved much the same as ordinary tonsils. He therefore concluded the lymphoid tissue was required in the naso-pharyngeal area, and even if every shred could be removed, some would reappear.

DR. JOHN BOSTOCK said he had listened with considerable interest to the paper on tonsil removal. It was a question of burning importance, as chronic tonsillitis was of very frequent occurrence. Some patients preferred to have their tonsils removed by diathermy, because they were averse to more radical procedures, others because of some accident to a friend or relative. Several of his patients had been treated by diathermy for removal of tonsils, but he considered that the results were not so good, and he now recommended surgical removal in practically every case. Nearly all patients could be compelled to have enucleation, and the total discomfort was certainly much less. When a nervous patient had to go for diathermy treatment time and again, it was undoubtedly prejudicial, and they were better if they "screwed up their courage", went once, and got it over. So from a psychological point of view, he would say that dissection of the tonsils appeared to be the better method.

DR. G. B. BATTAGLIA said he would not wish to advocate one or other method for the removal of tonsils, but considered it necessary that the medical practitioner should know more of the elemental conditions of each patient. Each case must be considered on its merits. If diathermy seemed to be the suitable treatment in a particular instance, good results could be obtained with diathermy, if it were used properly. Dr. Battaglia also emphasized the psychological aspect. Many people were nervous at the idea of having a general anæsthetic and would not submit to it. He himself used diathermy treatment for the removal of tonsils, first performing preliminary suction with a powerful glass tube. He considered that the tonsils were made by Nature with a physiological action; they sponged out germs from the food and air passed through the throat. After preliminary suction and examination of the material sucked out, a wider tube was taken and the tonsil sucked into this tube, which served as a tenaculum in the hand of the assistant; the tonsil was then coagulated from the base. In this way, namely, with the precedent treatment by suction, the tonsil was extroverted; any pus in its

crypts was expressed, and the bottling up of germs was avoided. There were anatomical differences to be considered in each case, and he could say he had had successes with his treatment. The great point was to choose the right method. Dr. Battaglia considered that tonsillectomy was greatly abused. In Italy a much smaller percentage of tonsils was removed, the conservative view being taken that every organ had some special reason for its presence and should not be removed unless removal was absolutely necessary.

DR. F. W. LUKIN congratulated Dr. Duhig and Dr. Graham Brown on their paper, not entirely because of the results or conclusions they had come to. He was not expressing any opinion as to the merits or demerits of either method; he was congratulating them rather on conclusions based on original work, which helped to formulate an opinion on a scientific ground. The work had been carried out in a consideration of results which probably would not be approved of by the diathermist himself, and which would not be classed among his successes. Dr. Lukin considered that more papers like these were required on original subjects, far more than on subjects which had been frequently discussed and were worn out. This subject was rather controversial, and Dr. Duhig and Dr. Brown had contributed original conclusions.

DR. ELLIS MURPHY congratulated Dr. Duhig and Dr. Brown on the presentation of their short paper, which showed definite original work. They had taken specific instances. They had shown pictures of the tonsils themselves, and microscopical slides showing that infection was present in the resultant scar after diathermy. One could not get away from these pathological results. Of course, probably in practice he himself only saw the failures, but he had yet to see the patient whose throat after diathermy was satisfactory; such patients had to have enucleation afterwards. There were a number of very nervous people who hated to face the surgeon; but their minds could be made up for them, and after one week's discomfort they were probably very much better off than if treated by the other method of diathermy.

Dr. J. V. Duhig, in reply, said he was very grateful for the patient hearing the meeting had given him. One point raised by Dr. Reye had been the presence of bacteria in scar tissue. In this particular investigation the infection had not been found in scar tissue, but in lymphoid tissue, which should not have been present if the diathermy had done its work and if the tonsil had been completely removed. He again expressed his opinion that it was owing to some defect in technique, probably due to the anatomical structure (after the work of more than one operator) that lymphoid tissue was left over in one particular situation in every case. A series of seven unselected patients had come up for operation after they had been told that their tonsils were sterile. At operation lymphoid tissue had been found still to be present; this finding had been confirmed by microscopical examination, and in the majority of cases infection had been present. Naked eye examination as to complete removal of tonsils by diathermy was a very weak reed to trust upon.

Dr. Graham Brown, in reply, said that first of all he would again point out that he had probably been the first practitioner in Queensland to use surgical diathermy. He had used it in the treatment of malignant disease, where the aim was to destroy as much as possible and to get as far as possible beyond the growth. This was a different use of the method than the diathermy of tonsils, for the object seemed to be achieved by doing as little destruction as possible at a sitting and to have an unlimited number of sittings. In reply to Dr. Reye, he stated that in one instance three years had elapsed since diathermy had been applied to the tonsil, and in this case the cultures had been taken, especially from the scarred remains, in order to see if any bacteria could be obtained there. A pure culture of *Streptococcus hæmolyticus* had been grown from this region as well as from another region of the specimen. Another patient had had the tonsil remains enucleated some two years after the diathermy treatment, and another, three or four months after treatment had ceased, but fifteen months after its commencement. In both these instances pure cultures had been obtained. Answering Dr. Reye's criticism concerning the nurse quoted by him, he said he wished to point out that this patient had not given symptoms of tonsillar disease, although pathological examination of her tonsils had revealed many interesting conditions. It was less than a month since this lady had written him the letter which was quoted in the article. She had put on about a stone in weight and she now looked very much better in health. He wished to point out that even after incomplete surgical removal of their tonsils, many patients lost their complaints, and in the toxic type of patient this was due, he thought, mainly to the fact that there was drainage from the crypts of the reduced tonsil mass. In those tonsils that were scarred on the surface there was generally a focal infection, and these patients came to the surgeon again for complete removal. Nowadays the throat surgeon totally enucleated the tonsil. There was a great difference between this incomplete surgical removal and the incomplete destruction by diathermy, for in the latter many crypts were "bottled up" or "sealed over" by the resulting scar, drainage thereby being interfered with; frequently total retention of the products of inflammation resulted. Certain of the photographs of the microscopical sections demonstrated this in a clear manner. When such a condition was present, absorption was increased considerably.

With regard to the question of patients' submitting to surgical treatment, he said that, except in a few instances, he had no difficulty in getting his patients to see the advantages of total removal by enucleation, and really the number unfit, physically or mentally, for such a procedure under local anæsthesia, was almost negligible. He considered that in most instances the very type of patient which the average diathermist held should have diathermy treatment on account of nervousness *et cetera*, was the very one, because of the psychical condition, that should not be treated by such a method. Since he had adopted the slogan, "the tonsil, the whole tonsil, and nothing but the tonsil" in surgical treatment of these structures, and had come to the logical conclusion that the most effective way to effect complete removal of tonsil and nothing else was by dissection, he had refused to have a diathermy apparatus in his consulting rooms; for he had thus been in a position to refuse to accede to requests which had been made to him from time to time to treat his patients by this method.

Dr. Duhig had joined him in this small piece of investigation. They had undertaken it mainly to give practitioners, particularly those in the country, information of definite value. Their findings emphasized how easy it was for the practitioner to fail in achieving his object when using this method of treatment.

Dr. Graham Brown considered that there was no excuse for a practitioner who was doing this class of work daily, to leave large portions of tonsils. If such a person was content to leave tonsillar tissue, it was an indication that he did not appreciate the seriousness of the condition, or he was incompetent. He felt that there were several members using the method extensively who should either improve their technique or discontinue the treatment, for the diathermist's aim should be, as it was the throat surgeon's, to remove "the tonsil, the whole tonsil, and nothing but the tonsil".

He said he had tried out suction tonsillectomy some eight years or so ago, but had found it more troublesome than straightforward dissection. He used the suction method of emptying crypts as a palliative treatment when the case required it.

He thought that mouth breathing was responsible for the occurrence of longitudinal ridges of lymphoid tissue behind the posterior pillars after tonsillectomy in quite a number of patients; therefore, nasal obstruction, if present, should be attended to.

In conclusion Dr. Graham Brown wished to thank all those who had joined in the discussion, and particularly those who had looked upon this small piece of investigation by Dr. Duhig and himself in the light of research, small though it was. His aim was to place definite facts before the general practitioner to help him to form his opinion, for he realized that the general practitioner was frequently

misled by statements made by certain leaders whose opinions, unfortunately in this instance, they had come to rely upon. He expressed his thanks to the President and the members of the Branch for their congratulations upon his election to a vice-presidency of the Section of Oto-Rhino-Laryngology at the forthcoming centenary celebrations of the British Medical Association. He greatly appreciated the honour and hoped to represent the Queensland Branch and also the specialty in Australia in a manner which would be satisfactory to all.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Cooper, Bryce Arnot, M.B., B.S., 1929 (Univ. Sydney), c.o. T. B. Cooper, Esq., Water and Sewerage Board, Sydney.

O'Brien, Clifford Raymond, M.B., 1926, Ch.M., 1927 (Univ. Sydney), State Hospital, Liverpool.

Correspondence.

THE USE OF CARBON DIOXIDE IN INDUCTION OF ANÆSTHESIA.

SIR: Regarding carbon dioxide in the induction of ether anæsthesia: that carbon dioxide is a great help in the induction of anæsthesia with ether is an established fact; I think I am correct in stating that I was amongst the first in Melbourne, if not actually the first, to adopt the method as a routine. I am quite certain, however, that it is not generally recognized that the drug is a very potent one (refer to page 121, THE MEDICAL JOURNAL OF AUSTRALIA, January 23, 1932).

In my teaching I have strenuously advocated the use of very small amounts of carbon dioxide during induction. In the early stages, one judged the amount administered solely by its effect on the patient. This was not altogether satisfactory. Since then I have incorporated a very simple and portable measuring device, consisting of a small football bladder of about one and one-half litres capacity, connected to the mask by a fine bore tube. A tap is placed between the bag and the mask. The bag is filled with carbon dioxide from the storage cylinder, which may then be removed. The flow of gas to the patient is controlled by means of the tap, the rate of flow being under observation as the bag deflates.

In my own practice, I have found that, for the average case, one litre is sufficient, the remainder being held in reserve. As a general rule, this litre of carbon dioxide is administered in a slow stream throughout the induction period of ten to fifteen minutes. Hence it is obvious that the actual percentage of carbon dioxide in the air inhaled by the patient is a very small fraction of one *per centum*.

The sole aim of the technique is to regularize and, perhaps, slightly deepen the respiration, and this effect is satisfactorily accomplished by so small an admixture of carbon dioxide.

The production of violently exaggerated respiration is extremely dangerous, not from the point of view of overdose of ether, in my opinion, but as a result of overstimulation of the respiratory centre, with subsequent fatigue resulting in respiratory depression or even respiratory failure, depending on the degree of over-stimulation. This in addition to any cardiovascular effect.

Any attempt at unduly rapid induction of anæsthesia must be deprecated. My own experience is that the time of induction is slightly increasing to an average of ten to fifteen minutes.

As to the effects on the sensibilities of the patients, I have had no complaints after inquiry, particularly in those where previous anæsthetization has taken place.

Referring to Dr. Hornabrook's letter in the journal of May 7, 1932, in which he complained of a feeling of strain after this type of induction, it is definitely my opinion that more carbon dioxide was given to him than was necessary.

In my practice, the induction with carbon dioxide-ether by the technique described, is as quiet as the onset of sleep in by far the larger proportion of cases.

Once again, may one stress the danger of uncontrolled use of carbon dioxide, and the necessity for incorporating in the anæsthetic kit some simple positive means of measuring the amount of carbon dioxide used and, even more particularly, the rate of administration.

Yours, etc.,

DOUGLAS G. RENTON, M.B., B.S.,
Honorary Anæsthetist, the Alfred Hospital and the Austin Hospital; Honorary Assistant Anæsthetist, Melbourne Hospital, Melbourne.

12, Collins Street,
Melbourne,
June 7, 1932.

ACCIDENTS OF THE BEACH.

SIR: The article by Dr. Stacy in your issue of May 21 implies indifference or incompetence on the part of the medical advisers of the Surf Life Saving Association of Australia. I would like, therefore, to reassure your readers and Dr. Stacy by pointing out that a new edition of the Association's handbook is in active preparation, and so far as the medical aspects are concerned, will incorporate the most suitable modern methods of resuscitation of proved value.

The present writer, as Dr. Stacy is probably aware, has been actively interested in the efficient therapeutic use of oxygen and carbon dioxide for a number of years, indeed before Professor Yandell Henderson's cries in the wilderness received general recognition and acceptance. As regards its use in asphyxia from drowning, he is aware of no recorded instance. Since, however, every theoretical consideration favours it, suitable apparatus will shortly be available for trial at a number of the principal surf life saving clubs. Should these trials prove satisfactory, as doubtless they will, the method will be recommended for general adoption.

A highly efficient, though simple and portable, type of apparatus, is at present being manufactured by the Commonwealth Oxygen Company under the supervision of the present writer. This apparatus will cost not more than about seven pounds, and additional cylinders about six shillings each. Each cylinder contains sufficient of the mixture for about fifteen minutes' administration. Naturally the gas must be used in conjunction with artificial respiration by the Schafer method. Should any of your readers care to inspect this apparatus, one is available in the Department of Physiology at the University of Sydney.

Dr. Stacy need therefore no longer "tremble to think how long before it will reach the beaches".

Yours etc.,

H. WHITRIDGE DAVIES.

The University of Sydney,
June 10, 1932.

DRAINAGE WITH IRRIGATION AFTER PROSTATECTOMY.

SIR: The paper published on June 4, 1932, by Dr. John Morton, "The Method of Drainage with Irrigation after Prostatectomy", should not be allowed to pass unnoticed, as it contains many statements which are, to say the least, open to criticism. For the sake of brevity I shall confine my criticism to what I consider only the more outstanding features.

Dr. Morton says: "Time spent in the complete controlling of hæmorrhage is not to be grudged." With this all will agree, but when he goes on to say that a thermo-cautery is useful when catgut has failed, he will find few, if any, to

agree with him. He is indeed an optimist who would rely on any type of cautery to control hæmorrhage after prostatectomy.

Dr. Morton further states that, in his opinion, "any toilet of the prostatic cavity . . is not essential to the complete success of the operation". It is, of course, a fact that a certain proportion of patients will completely recover, whatever operative technique is used. The important question is which technique yields the lowest mortality and morbidity, not with what technique is it possible for some patients to make a complete recovery.

Dr. Morton goes on to say that to depend on a catheter for drainage does not appeal to him as the most satisfactory method, as it is liable to become blocked, leading to leakage, sepsis *et cetera*. I can say without fear of contradiction that a catheter in the urethra should never be used as the sole method of drainage unless a complete toilet of the prostatic cavity has been carried out and all hæmorrhage controlled by ligature or suture.

Dr. Morton further states that "it adds greatly to the patient's comfort to have a temporary drain through the perineum". This may be advisable when the prostatectomy is performed in the manner he advocates, but it is an unnecessary infliction when a complete technique is carried out.

The method of passing a perineal drainage tube into the prostatic cavity advocated by Dr. Morton has been practised by Andrew Fullerton, of Belfast, in a somewhat different form and without the urethral irrigating tube. Fullerton takes care not to injure the external sphincter of the bladder, whereas with Dr. Morton's technique it would be difficult to avoid injury to it. This may not always be of serious import, but there would be great liability to post-operative urinary incontinence, since the internal sphincter would already have been destroyed by the method he advocates of suprapubic prostatectomy.

Yours, etc.,

S. HARRY HARRIS,
M.D., Ch.M., F.R.A.C.S.

185, Macquarie Street,
Sydney,
June 10, 1932.

STAMMERING.

SIR: Dr. James J. Woodburn, in his criticism (*vide* THE MEDICAL JOURNAL OF AUSTRALIA, May 21, 1932, page 753) of my paper on "Stammering, A National Tragedy", would treat stammering by the correction of nasal, oral, pharyngeal, laryngeal and thoracic complaints. He draws attention to irregular action of the lower thoracic diaphragmatic and abdominal muscles, as contrasted with the perfect muscular control of the best public speakers.

There is a certain indefiniteness about Dr. Woodburn's criticism. In the first place he agrees that stammerers are on the average as physically fit as those without speech defects.

To me the question arises: What causes a normal physical condition to function abnormally? Does not some non-physical, that is, psychical or "nervous", factor appear to be involved?

In the second place he agrees that in some cases there may be a "nervous" element.

A further defect of the criticism is that Dr. Woodburn offers no explanation of what is meant by this "nervous" element.

Possibly I can assume Dr. Woodburn is in general agreement with me on methods of treatment where the "nervous" element obtains, but not when there is no "nervous" element.

I have not overlooked the latter cases and in my article said: "It is not denied that in some cases elocutionary or physical exercises have proved of some benefit . . . There are cases of defective articulation and hesitancy of speech which may yield to these methods." I have, however, added: "These are not cases of stammering," and it is here that I touch on the central aspect of Dr. Woodburn's criticism.

The cases where there is no "nervous" element I do not regard as developed cases of stammering at all. They are as steps on the road to "the real thing" and it is this real stammering which constitutes the majority of cases and those which present the greatest difficulties.

The kind of treatment advocated by Dr. Woodburn indicates to me that he fails to grasp the psychical nature of stammering. I quote again from my article: "The invariable mark of stammering is the psychosis of dread or fear . . . Stammering may lead to faults of breathing and articulation," that is, it is causal to these—they are merely external symptoms.

My detailed account of the stammerer's psychical world appears to be not appreciated; I cannot repeat it here. I doubt whether Dr. Woodburn has been a stammerer himself (although he has not happened to refer to that point), as my investigations of stammerers over many years, as well as my own personal experience, confirm the reality of the psychical content. I have taken intensive courses in England under the best known exponent of the day in the very treatment Dr. Woodburn advocates and for some time utilized that treatment in the correction of my patients, all to no effect.

I would draw attention to one fundamental fact about stammering, the significance of which my critic does not appear to have grasped. I stated: "No fact more significantly proves psychical abnormality than that a stammerer when alone can speak perfectly. There are but rare instances of a stammerer having trouble when alone. What is the mysterious pathological change which takes place when the stammerer meets with the presence of others? There is no physical change in tongue or lips or larynx."

I cannot make a clearer answer than this extract to Dr. Woodburn's criticism, which to me appears to take negligible account of the ultimately psychical basis of the ailment. Hence, as measures of treatment designed to reach the root cause, the whole system of nasal, laryngeal, pharyngeal and thoracic treatment appears to me to fall to the ground.

In reply to Dr. Woodburn whether stammering is the cause of the nervous state or whether the physical defect in incorrect breathing comes first, my conviction is that the former is the truth. "Stammering affords its own peculiar problem; that problem is not a derivative one."

My thanks are due to Dr. Woodburn for his criticism, which represents a more or less widely held point of view.

Yours, etc.,

T. GARNET LEARY.

Sandringham, Victoria,
June 13, 1932.

"AVERTIN."

SIR: I have read with considerable interest your "leader" on "Avertin" and the comments thereon in THE MEDICAL JOURNAL OF AUSTRALIA of June 4 and June 18 respectively.

With the introduction of "Avertin" as a preliminary basal narcotic the customary uneventful post-operative course, following the administration of "open" or "machine-given" ether, has recently been rudely disturbed by the undue frequency of certain pulmonary complications. Under the above "Avertin"-ether sequence convalescence after five consecutive recent operations has been marred by the development of the following respiratory affections:

1. Lobar apneumatosis, following gastro-enterostomy and sequestration of duodenal ulcer.

2. Fatal bronchopneumonia, after gastro-enterostomy combined with gastrostomy (Nordenbos's operation).

3. Mild bronchopneumonia, after repair of incisional hernia.

4. Cyanosis and deep anæsthesia, temporarily relieved by "Carbogen" and thyroxin (1·2 cubic centimetres), following resection enucleation for adenoma of the thyreoid. Cyanosis persisted for five hours.

5. Lobar apneumatosis, following "interval" appendicectomy.

So frequently are the above complications being met with in association with this anæsthetic combination that post-operative acceleration of the pulse rate should demand careful clinical and, if possible, radiological examination of the chest.

Two points in the above-mentioned "leader" should be emphasized.

First, "The standard doses are laid down and should not under any circumstances be exceeded." The necessary correction for wearing apparel should be made if the patient be weighed in street clothes.

Second, "Only by the most careful scrutiny of clinical and *post mortem* records will more be learnt about 'Avertin'." Instead of watching the surgical operation (*vide* Dr. Coghlan's letter of the issue of June 18, 1932), the administrator would be more profitably employed compiling data for an anæsthetic record, such as that suggested by Dr. F. H. McMechan at the Australasian Medical Congress held in Sydney during September, 1929.

Only by such means will the true value of "Avertin" be assessed.

Yours, etc.,
H. RUTHERFORD DARLING.

229, Macquarie Street,
Sydney,
June 20, 1932.

THE INTERNATIONAL CONGRESS OF OTO-RHINO-LARYNGOLOGY.

SIR: Postponement of the Second International Congress of Oto-Rhino-Laryngology (Madrid), until next year, seems inevitable, according to an official communication just received by me.

When the date of meeting has been definitely decided, I will notify the journal. Meanwhile it would save disappointment to intending members if you would be good enough to publish the fact.

Yours, etc.,
GARNET HALLORAN,
Member Permanent Committee.

143, Macquarie Street,
Sydney,
June 23, 1932.

POLIOMYELITIS.

SIR: It is encouraging that after seventy years the principles enunciated by one great Swedish teacher are being recognized generally, though they are attributed to other workers and appear under high-sounding titles. He was the first, as far as I know, to insist upon the value of volitional movements as opposed to passive. Rest is mentioned by your contributors of June 4, but the value of complete rest is not insisted upon. The affection is not localized, therefore rest should not be localized and should be absolute as far as possible for the first four weeks at least. Well applied plaster is to me the easiest method. Circular bandages are twenty years out of date. It is more important to give the patient complete rest than to discover if small muscles are involved.

I am glad that the "zero" position of Batten is almost entirely abolished for the "neutral" position of T. S. Ellis. Why Dr. Hembrow still uses it for shoulder cases I cannot understand.

I do not agree with many of Dr. Hembrow's descriptions of production of deformities, especially "claw toes" and scoliosis. I have never seen the latter associated with weakness of the sterno-mastoid.

Dr. Vance advises "even crawling" exercises; this is most valuable, and crawling on hands and knees is one of the very best exercises for the trunk muscles.

Yours, etc.,
W. KENT HUGHES.

22, Collins Street,
Melbourne.
Undated.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

THE regular monthly meeting of the Senate of the University of Sydney was held on June 13, 1932.

The following appointments were approved: Dr. A. Bolliger as Research Director of the Dr. Gordon Craig Urological Laboratory; Dr. M. R. Flynn as Tutor in Surgery at the Royal Prince Alfred Hospital; Dr. J. Colvin Storey as Lecturer in Clinical Surgery at the Royal Prince Alfred Hospital; Dr. Arthur Palmer as Lecturer in Medical Jurisprudence, and also as Lecturer in Medical Ethics; Dr. W. E. Fisher as Marion Reddall Scholar (reappointment).

THE UNIVERSITY OF MELBOURNE.

The Diploma in Laryngology and Otology, and the Diploma in Ophthalmology.

THE Registrar of the University of Melbourne has forwarded the following particulars in regard to the courses to be taken by medical practitioners desirous of obtaining the Diploma in Laryngology and Otology or the Diploma in Ophthalmology at the University of Melbourne.

Diploma in Laryngology and Otology.

The times to be spent at the different hospitals are: six months at the Eye and Ear Hospital and six months in the special work of a general hospital, or, in the case of those candidates who are required to do six months' work only, three months at the Eye and Ear Hospital and three months in the special work of a general hospital.

The honorary surgeons of the clinic or their deputies are approved as teachers. Operative surgery is to be taught by the honorary surgeon of the clinic.

Fees.—The fee of £5 5s. for instruction in pathology and of £4 4s. for instruction in bacteriology, already fixed, will be held to include instruction also in the pathological department of the Eye and Ear Hospital. A further amount of £28 7s. will be collected by the University and allotted by it amongst the instructors concerned.

Diploma in Ophthalmology.

Candidates for the Diploma in Ophthalmology will be required to attend the ophthalmic clinic at the Eye and Ear Hospital for twelve months, and concurrently to attend the eye department of a general hospital for three months.

Instruction in diseases of the eye and adnexa, in methods of examination, in motor anomalies *et cetera*, will be included in the twelve months' teaching at the Eye and Ear Hospital.

Candidates will be required to produce a certificate from an ophthalmic surgeon at one of the general hospitals to the effect that they have attended a course in the subject of ophthalmology in relation to medicine.

One of the surgeons at the Eye and Ear Hospital will give a course of instruction in operative surgery, which shall include a definite course in operative surgery on pigs' eyes, together with attendance and assistance at operations on human eyes.

Part of the instruction in pathology and bacteriology is to be given by the pathologist at the Eye and Ear Hospital and part at the University.

The Alfred Hospital will be asked for this year to arrange a course in slit lamp work.

The minimum number of lecture-demonstrations in operative surgery is twelve, in pathology and bacteriology eighteen, and in microscopy of the living eye, six.

The three ophthalmic surgeons at the Eye and Ear Hospital and the ophthalmic surgeons at the general hospitals, or, in their absence, their deputies, are approved as instructors.

Fees.—The fees of £5 5s. and £4 4s. already fixed for instruction in pathology and bacteriology respectively will be held to include payment for the work at the Eye and Ear Hospital as well as at the University. The fee for the

course in slit lamp work is £6 6s. The fee for that in medical ophthalmology is £5 5s., and an inclusive fee of £17 17s. will be charged for the remainder of the work.

Medical Prizes.

THE ROBERT H. TODD PRIZE IN MEDICAL JURISPRUDENCE.

ADDITIONAL subscriptions towards the Robert H. Todd Prize in Medical Jurisprudence have been received as follows:

£1 1s.: Professor W. S. Dawson, Professor Harvey Sutton, Dr. A. H. Moseley.

The total amount received to date is £64 6s. 6d.

Obituary.

FREDERICK DELL HAYMAN.

WE regret to announce the death of Dr. Frederick Dell Hayman, which occurred on June 23, 1932, at Sandringham, Victoria.

NOTICE.

AT a meeting of the Executive Committee of the Australasian Medical Congress (British Medical Association), held at the Perth Hospital, Perth, on April 11, 1932, it was resolved to postpone the date of Congress to October, 1934. It was felt that, owing to the adverse economic conditions, there was little likelihood of a large attendance of members from the Eastern States of the Commonwealth before that date. It was further resolved to suggest to the Federal Committee of the British Medical Association that it might be practicable to hold Congress in one of the Eastern States at an earlier date than October, 1934.

MEMBERS are requested to note that the meeting of the Section of Pædiatrics of the New South Wales Branch, British Medical Association, advertised to be held at the Royal Alexandra Hospital for Children at 8 p.m. on Friday, July 8, 1932, will be held instead at 4 p.m. on Friday, July 15, 1932. A paper entitled "Syphilis in Children" will be read by Dr. George Norrie.

Books Received.

IS IT A BOY? SEX DETERMINATION ACCORDING TO SUPERSTITION AND TO SCIENCE, by F. Ökland; 1932. London: George Allen and Unwin, Limited. Crown 8vo., pp. 92, with illustrations. Price: 3s. 6d. net.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

LAUNCESTON PUBLIC HOSPITAL, TASMANIA: Resident Medical Officer (male).

MATER MISERICORDIÆ PUBLIC HOSPITAL, QUEENSLAND: Resident Medical Officer (male).

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers.

SAINT VINCENT'S HOSPITAL, MELBOURNE, VICTORIA: Honorary Officers.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.